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A STUDY OF SOME SOCIAL AND PSYCHOLOGICAL FACTORS INFLUENCING EDUCATIONAL ACHIEVEMENT.

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EDUCATIONAL SUBJECT-MATTER PREFERENCES, INTERESTS, AND MOTIVATIONS OF STUDENTS WERE INVESTIGATED AS THEY RELATE TO INDIVIDUAL ACADEMIC SUCCESS. AN INTENSIVE STUDY WAS FIRST MADE OF THE ATTITUDES AND REASONING ACTIVITIES OF INDIVIDUALS AT VARYING LEVELS WITHIN THE BERKELEY, CALIFORNIA, AREA, USING--(1) WRITTEN AND ORAL PROTOCOLS, (2) OBSERVATIONS, AND (3) PREVIOUS CENSUS, SURVEY, AND INVENTORY INFORMATION. STATISTICS IN THE GATHERED MATERIAL INCLUDED INDIVIDUAL SUBJECT AREA GRADES, PERSONAL DATA, EDUCATIONAL AND VOCATIONAL ASPIRATIONS, STANDARDIZED ACHIEVEMENT SCORES IN MATHEMATICS AND SCIENCE, AND GROUP-INDIVIDUAL TESTS ON INTERESTS AND ATTITUDES. THE ELEMENTARY SCHOOL EXPERIENCE OF SUBJECTS WAS ASSESSED BY A CASE STUDY METHOD. FINDINGS OF THE OVERALL RESEARCH WERE PRESENTED UNDER FOUR HEADINGS--(1) THE INFLUENCE OF THE PEER GROUP, (2) THE EFFECT OF AN INTEREST IN DELIBERATE MENTAL ACTIVITY UPON ACHIEVEMENT, (3) THE SPECIALIZATION OF THESE INTERESTS AS BEING SOCIALLY OR NONSOCIALLY ORIENTED, AND (4) THE INFLUENCE OF THE STATUS AND STYLE OF LIFE OF THE FATHER. AREAS OF FURTHER RESEARCH WERE INDICATED. RELATED TO THE DEVELOPMENT OF INSTRUMENTS FOR MEASURING ATTITUDES AND ACHIEVEMENTS, PANEL STUDIES OF SOCIAL AND PSYCHOLOGICAL MOTIVATIONS, AND STUDIES OF SCHOOL PROGRAM VARIETIES. (JH)

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# A STUDY OF SOME SOCIAL AND PSYCHOLOGICAL FACTORS INFLUENCING EDUCATIONAL ACHIEVEMENT

by

T. Bentley Edwards
and
Alan B. Wilson

The research reported herein was performed pursuant to a contract with the United States Office of Education, Department of Health, Education and Welfare.

Final report on project SAE 7787 "The Specialization of Attitudes as Related to Academic Success at Varying Academic Levels."

Department of Education
University of California
June, 1961

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T.B.E.
A.B.W.

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# I. INTRODUCTION

A recurring question among educators asks why some children succeed in school and others do not. This question is sometimes thought to have more to do with learning than with teaching. Variations in achievement are ascribed to differences in ability and in motivation. Unravelling these sources of achievement is not an acute concern of those schoolmen who define their task as the screening and training of an elite corps of leaders up to a preconceived set of standards. It suffices to fairly assess achievement and to let backsliders fall by the wayside.

With the advent of mass public education a different view of the scope and responsibility of educators has become apparent. The task is seen as maximizing the achievements of all children. Not all children are capable of reaching the same educational standards, but all children are capable of development. This view of education draws increasing attention to the causes underlying variations in achievement. Successful study of these causes may well assist in so modifying teaching procedures as to result in an increase of achievement by all children.[1]

While the terms, "ability" and "motivation", are amorphous, in common parlance they have distinct connotations. Ability refers to a fixed, though perhaps unrealized, potential to achieve in some or any field, while motivation, in this context, refers to a present desire, anxiousness or drive to achieve.

---

[1] To a considerable extent the conflict between those who would conserve a rationally predetermined curriculum and those who would modify the curriculum so as to engage more students reflects a lack of resolution on the issue of the scope of the educator's responsibility.

During the so-called "scientific movement in education" no little effort went into the task of developing and refining operational and objective procedures for the assessment of achievement and ability. The raison d'être for this effort was manifold--to perform the necessary screening task while assuring "equality of opportunity," to reconcile abilities with curricula, to uncover hidden genius.

In recent years it has become increasingly manifest, however, that any operational procedure for assessing ability must, in fact, test some present achievement. While in a stable and homogeneous environment, future performances may be highly predictable from present achievements, the reification of this functional relationship between present and future attainments under the rubric of "ability", masks the role of environmental influences and directs attention away from the possibility of controlled change. It serves as a methodical normalization of the present.

With the diffusion of environmentalistic explanations of behavior from the social sciences, investigators have tended to shift their attention from innate abilities to motives. These investigations are conducted at different levels. The widest application, both in research and practice, in the field of education, is at a psychological level. Individuals are typed according to their predominant interests, say, or the intensity of their need to achieve, and these attributes are taken as independent variables in the explanation of their academic behavior. However, as E. K. Strong has observed, ". . . interest tests do not correlate to any practical degree with measures of success."[1]

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[1] E. K. Strong, "Prediction of Educational and Vocational Success through Interest Measurement," Proceedings: Invitational Conference on Testing Problems (Princeton: Educational Testing Service, 1957), p. 72.

One reason for the want of a clear-cut association between interests and achievement, which intuition would lead us to expect, is the multiplicity of influences bearing upon achievement which obscures simple one-to-one relationships.

Since the 1930's a considerable amount of evidence has accumulated documenting the association between the social status of the family and the academic interests, aspirations, and achievements of children. The main emphasis of these studies has been on the demonstration of the actual inequality of educational opportunity in our society, and the restrictions which this inequality places upon occupational mobility and the efficient utilization of manpower.

A few studies have penetrated beyond this demographic level to explore some of the psychocultural consequences of stratification. The now classic works of Davis and Eells[1] have shown the disadvantages of working-class children in coping with the linguistic and conceptual tasks required by the schools. Students with higher socioeconomic status have been shown to be more oriented toward future success than toward the gratification of immediate desires.[2]

More recently attention has been turned to the effects of the social context in which children are socialized upon their perceptions, expectations, and aspirations. The larger the community of orientation, the higher are the aspirations of working-class youths likely to be,[1] and the more successful they are apt to be in climbing to non-manual occupations.[2] Rural farm youths have lower education aspirations and discontinue schooling sooner than their non-farm compeers who recognize the relevance of formal education to their occupational aspirations[3] and are more apt to migrate to urban centers.

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[1] Allison Davis, Social-Class Influences upon Learning (Cambridge: Harvard University Press, 1957); Kenneth Walter Eells, Intelligence and Cultural Differences: a Study of Cultural Learning and Problem-Solving (Chicago: University of Chicago Press, 1951).

[2] Bernard C. Rosen, "The Achievement Syndrome: a Psychocultural Dimension of Social Stratification," American Sociological Review, XXI (April, 1956), 203-11; Richard Hoggart, The Uses of Literacy: Aspects of Working-Class Life, with Special Reference to Publications and Entertainments (London: Chatto and Windus, 1957).

Even the present upsurge of interest among members of the academic community is tinged with this utilitarian point of view. Witness the heavy emphasis suggested for mathematics, science, and foreign languages, and the relative neglect of literature, music, art, and even history. While we agree with the necessity of persuading children, up to a point, such persuasion must constantly hold in mind the period when the child can be expected to use responsibly the energy that derives from his own passion for ideas.

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[1] Charles M. Grigg and Russell Middleton, "Community of Orientation and Occupational Aspirations of Ninth Grade Students," Social Forces, XXXVIII (May, 1960), 303-308.

[2] Seymour Martin Lipset, "Social Mobility and Urbanization," Rural Sociology, XX (September-December, 1955), 220-28. Cf., also, Seymour Martin Lipset and Reinhard Bendix, Social Mobility in Industrial Society (Berkeley: University of California Press, 1959), pp. 204-206.

[3] Herman M. Case, "College as a Factor in Occupational Choice: a Study of Different Perceptions by Farm and Nonfarm Youth," The Journal of Educational Sociology, XXX (December, 1956), 191-99; Archie O. Haller and William H. Sewell, "Farm Residence and Levels of Educational and Occupational Aspiration," The American Journal of Sociology, LXII (January, 1957), 407-11; E. Grant Youmans, The Educational Attainment and Future Plans of Kentucky Rural Youths, Kentucky Agricultural Experiment Station, Bulletin 664 (Lexington, Ky.: University of Kentucky, 1959); Pitirim A. Sorokin, Carle C. Zimmerman, and Charles J. Galpin (eds.), A Systematic Source Book in Rural Sociology (3 vols.; Minneapolis: The University of Minnesota Press, 1930-1932), I, 228-30, II, 195-260, III, 226-351.

By one means or another those influences on learning which have traditionally led certain students to the development of intrinsic interest and which probably never cease to exercise at least a partial influence upon his devotion to study must be singled out and investigated, first for their immediate effect upon learning, and second for their relationship to the development of interests which can be expected to be self-generating and therefore lasting.

Most pertinent to the concerns of educators is the effect which the ethos of the school itself may have upon its students. In a previously published aspect of the research project here being reported[1] large discrepancies were found in the social compositions of eight high schools in the San Francisco-Oakland urbanized area, and in the modal educational and occupational aspirations of their student bodies. The schools, however, were by no means perfectly homogeneous. There were some children of manual workers, whose parents were ill-schooled, attending predominantly middle-class schools; and, on the other hand, there were children of college-trained professionals in the working-class schools. Attention was focused upon these deviant groups to confirm the idea that the school environments served as significant normative references in molding the students' aspirations. While ninety-three per cent of the sons of professionals at the highest status schools wanted to go to college, fewer than two-thirds of the sons of professionals at the predominantly working-class schools wished to do so; and whereas only a third of the sons of manual workers at the latter schools wished to go to college, more than a half of their compeers who attended predominantly middle-class schools so wished.

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[1] Alan B. Wilson, "Residential Segregation of Social Classes and Aspirations of High School Boys," American Sociological Review, XXIV (December, 1959), 836-45.

Students do not enter high school, however, free from predispositions. Their expectations for or disaffections from schooling are formed early in their careers. Joseph A. Kahl[1] has pointed out that early success in schooling has the consequence of raising both parental and self-expectations for future achievement. More recently Talcott Parsons has argued that the differentiation of students along on achievement axis in the elementary schools is crucial to their bifurcation into college-goers and non-college-goers, and to their subsequent allocation to occupational positions.[2]

Students are exposed to segregation in the elementary schools prior to their high-school experiences. For some students this would involve a discontinuity in educational socialization, for others a reinforcement. In the study of high-school students, this variation in early school experience constitutes an uncontrolled source of variation. Other sources of variation lie in the differences between school districts in administration, counseling and guidance services, and expenditures per pupil.

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[1] Joseph A. Kahl, "Educational and Occupational Aspirations of 'Common Man' Boys," The Harvard Educational Review, XXIII (Summer, 1953), 186-203. Cf., Prescott Lecky, Self-Consistency: A Theory of Personality (New York: Island Press, 1945).

[2] Talcott Parsons, "The School Class as a Social System: Some of Its Functions in American Society," The Harvard Educational Review, XXIX (Fall, 1959), 297-318.

In most cities and towns of moderate size the students from several elementary schools under the same administration feed into a single comprehensive high school. Within such communities it is the segregation of students in their elementary school years which is of greater relevance. If elementary schools provide students with differing cultures, some schools strengthening and some resisting the intergenerational inheritance of social position, they lay a foundation which later integration in higher schools cannot refashion. The use of "impartial" criteria for screening and sorting students in the junior and senior high schools in large measure identifies attainments and intentions earlier developed.

In the spring of 1959 a study, described in Appendix A, was made of the elementary school children in Berkeley, California. The data from this study enabled the authors to determine the extent of the differences in social composition between the elementary schools, to confirm the relationship between familiar background and academic achievement and aspirations, and to investigate how the differing school milieux might modify this relationship. To what extent do the teachers adapt their norms of "success", their concepts of "excellence", to the composition of their student bodies? Are elementary school students sensitive to the values and aspirations predominant among their peers, as high-school students seem to be, or is the orientation toward peers contingent upon the adolescent severing of apron strings? How do variations in the structure and cohesion of the peer group relate to mobility aspirations?

Chapters 2 to 5 will report in detail upon an analysis of the effects of these social factors upon the achievement and educational aspirations of sixth-grade boys.[1] Beginning in the sixth chapter an analysis of the joint effects of these background and situational factors, together with psychological variables, will be initiated.

The factors and variables will be related to inventory items in which the student is questioned concerning his present concern with abstractions. We shall be concerned with exploring the development of attitudes which favor study and understanding for their own sake, not because of a high relationship between such study and advanced socioeconomic status, important as the promise of pecuniary success may be in helping the child through the early and often less interesting parts of his learning.

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[1] This section has been reported in the form of a Ph.D. dissertation by the junior author, Alan Wilson.

## II. STRATIFICATION IN THE BERKELEY PUBLIC SCHOOLS

The city of Berkeley lies on the eastern shore of the San Francisco Bay, between Oakland and Emeryville to the south, and Albany and El Cerrito to the north. Viewed from the Bay one sees in the foreground stretches of regular flat blocks, housing light industries and warehouses interspersed with modest frame homes. This gives way to shopping districts and municipal buildings centered in a wide residential band. In the background lie the Berkeley Hills. The campus of the University of California, running back into Strawberry Canyon, divides this background. In the wooded hills the roads twist and turn. Redwood and stucco California homes, partially hidden from the roads, command a panoramic view of the Bay--of San Francisco, the Golden Gate and East Bay bridges. The aesthetic and scenic values of location rise with the elevation, if one overlooks--literally--the blighted foreground, the Berkeley Flats.[1]

The Hills are populated predominantly by professionals--the professors at the university, "free" professionals (doctors, dentists, architects), business managers, and proprietors, with very few manual workers. The occupational composition in the Flats is reversed, manual workers constituting the largest proportion of the population. The intermediate band, the "Foothills", is more heterogeneous, having almost equal proportions of five occupational groups shown in Table 2.1.

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[1] Berkeley Planning Department, The Problem of Blight in Berkeley: a Neighborhood Analysis for Urban Renewal (Berkeley: mimeographed, January, 1958).

There are fourteen elementary schools in the Berkeley Public School system. These feed into three junior high schools, which, in turn, feed into a single comprehensive high school. Each of the elementary schools serves the children in a defined attendance area.[1] By superimposing both the boundaries of the elementary school attendance districts and the United States census tract boundaries upon a detailed map of Berkeley (as is illustrated, in outline, in Fig. 2.1), the proportion of the population of each census district lying within each school district can be estimated.[2] Using these proportions as factors to translate census-tract data into school-district data, the attributes of the school district populations (as they were a decade ago, in 1950) were ascertained.

In Table 2.1 we can see that two-thirds of the employed males in the Flats are manual workers whereas only one-fifth in the Hills area are engaged in manual work. Similarly, while well over a half in the Hills are professionals, managers, and kindred workers, less than one-fifth in the Flats hold comparable positions. While there is some variation between the individual school districts within each of the three broad strata--e.g., Cragmont district having the highest concentration of high-status

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[1] There are a few interstitial "areas of choice" in which parents are allowed a choice from among adjoining school districts. Each block of these interstitial areas was assigned to a school district on the basis of the apparent accessibility and proximity of the surrounding schools for the purpose of the calculations described in n. 2, below.

[2] This was done by totalling the number of occupied dwelling units in each block lying within a given school district for every census district. The data are provided in the U.S. Bureau of the Census, U.S. Census of Housing: 1950 (Washington, D.C.: U.S. Government Printing Office, 1952), Vol. V: Block Statistics, Part 17, pp. 4-17. The calculated proportions are reported in Appendix D.

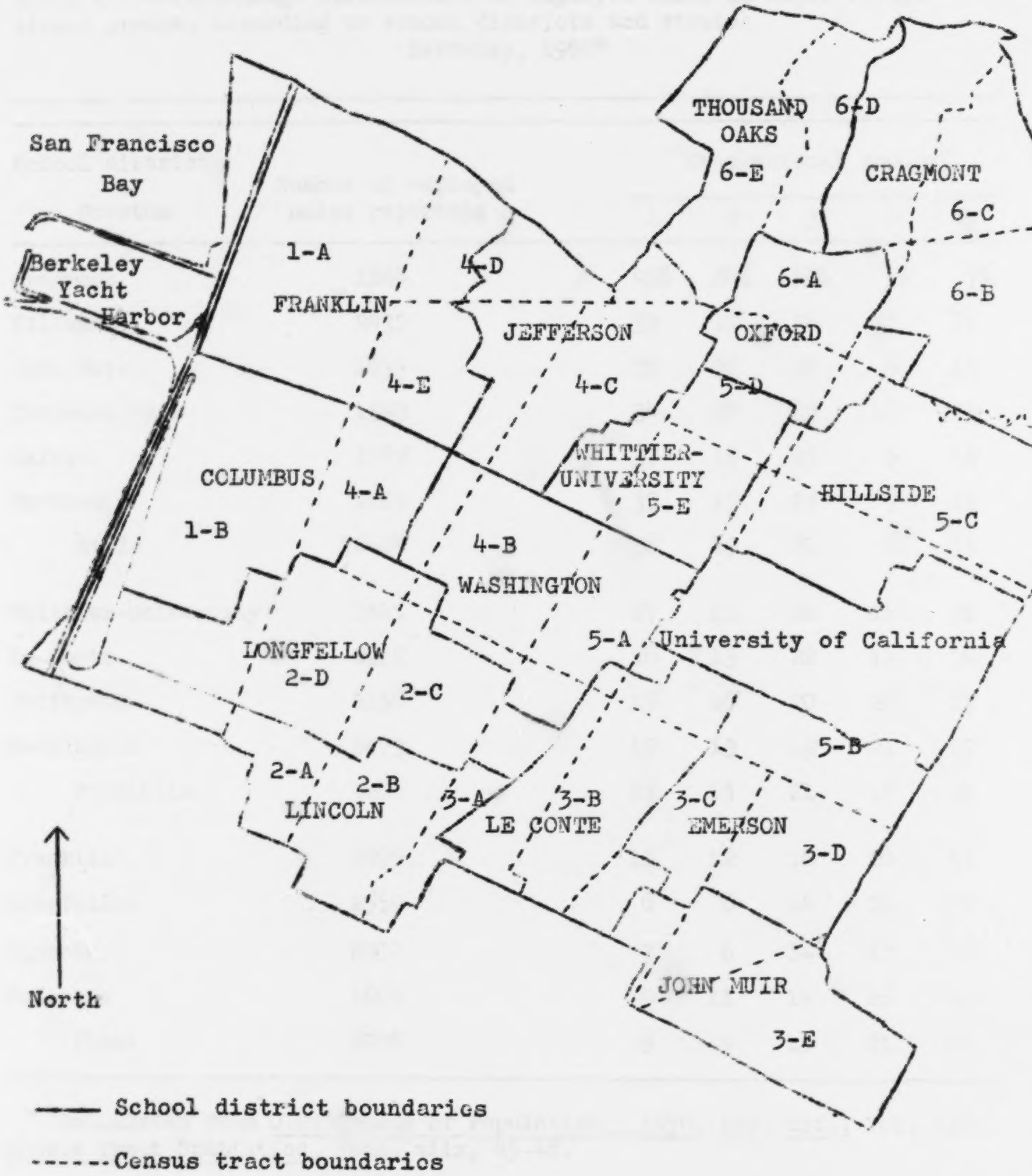
San Francisco Bay
Berkeley Yacht Harbor
1-A
FRANKLIN
4-D
4-E
COLUMBUS
4-A
1-B
JEFFERSON
4-C
THOUSAND OAKS
6-E
6-D
CRAGMONT
6-C
6-A
6-B
OXFORD
5-D
WHITTIER-UNIVERSITY
5-E
HILLSIDE
5-C
4-B
WASHINGTON
5-A
University of California
LONGFELLOW
2-D
2-C
5-B
2-A
2-B
LINCOLN
3-A
3-B
LE CONTE
3-C
EMERSON
3-D
JOHN MUIR
3-E
North
School district boundaries
Census tract boundaries

Fig. 2.1--Outline map of Berkeley, with 1950 census tracts and 1959 elementary school districts superimposed

TABLE 2.1.--Percentage distribution of employed males in major occupational groups, according to school districts and strata: Berkeley, 1950[a]

| School district<br>Stratum | Number of employed males reporting | Occupational groups[b] | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| Cragmont | 1864 | 45% | 24% | 18% | 5% | 7% |
| Hillside | 2435 | 39 | 12 | 21 | 7 | 21 |
| John Muir | 1233 | 35 | 26 | 22 | 6 | 11 |
| Thousand Oaks | 1590 | 34 | 24 | 22 | 11 | 9 |
| Oxford | 1079 | 37 | 19 | 23 | 9 | 12 |
| Emerson | 2223 | 35 | 15 | 23 | 7 | 19 |
| Hills | 10424 | 38 | 19 | 21 | 7 | 14 |
| Whittier-University | 1645 | 27 | 15 | 21 | 15 | 21 |
| Le Conte | 2912 | 28 | 13 | 22 | 14 | 24 |
| Jefferson | 2158 | 19 | 18 | 20 | 20 | 23 |
| Washington | 2473 | 19 | 13 | 19 | 21 | 27 |
| Foothills | 9186 | 23 | 15 | 21 | 17 | 24 |
| Franklin | 3295 | 11 | 12 | 16 | 20 | 41 |
| Longfellow | 2559 | 8 | 8 | 14 | 21 | 49 |
| Lincoln | 2250 | 7 | 6 | 14 | 17 | 56 |
| Columbus | 1603 | 9 | 11 | 14 | 26 | 40 |
| Flats | 9706 | 9 | 9 | 15 | 21 | 47 |

[a] Calculated from U.S. Census of Population: 1950, loc. cit., Vol. III: Census Tract Statistics, chap. xlix, 45-48.

[b] Occupational categories, as defined in the census, were combined in this table into the following groups:

1. Professional, technical, and kindred.
2. Managers, officials, and proprietors (including farm).
3. Clerical and sales.
4. Craftsmen and foremen.
5. Operatives, private household workers, service workers, laborers, and farm laborers.

occupations in the Hills--the largest and most significant differences are between the strata: Hills, Foothills, and Flats.

Occupation, in our society, is the most salient single indicator of an individual's status in the social hierarchy. Not only does it mark and identify the prestige of individuals in its own right,[1] but it closely reflects a person's educational attainment, as we have seen, his income, his habits of consumption, and, to a considerable extent, his style of life--his tastes, associations, politics, and values.[2]

In Table 2.2 the distribution of the educations of all persons twenty-five years old or older have been computed for each school district. Since we know that education and occupation are closely related, we would expect the school districts to fall in approximately the same order in average educational attainment as in occupational placement. Indeed, the association is exceedingly close--the proportion of college graduates in each school district being within a few percentage points

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[1] See the discussion and references in Lipset and Bendix, Social Mobility . . . , op. cit., pp. 14-17, and especially nn. 5-11. Also Joseph A. Kahl and James A. Davis, "A Comparison of Indexes of Socio-Economic Status," American Sociological Review, XX (June, 1955), 317-25; W. Lloyd Warner, Marchia Meeker, and Kenneth Eells, Social Class in America: a Manual of Procedure for the Measurement of Social Status (Chicago: Science Research Associates, Inc., 1949), chap. x.

[2] See, e.g., Theodore Caplow, The Sociology of Work (Minneapolis: The University of Minnesota Press, 1954), pp. 124-41; Joseph A. Kahl, The American Class Structure (New York: Rinehart & Company, Inc., 1957), pp. 108-22, 157-83; F. M. Martin, "Some Subjective Aspects of Social Stratification," Social Mobility in Britain, ed. D. V. Glass (Glencoe, Ill.: The Free Press, 1954), pp. 51-75; Maurice Halbwachs, The Psychology of Social Class, trans. Claire Delavenay (Glencoe, Ill.: The Free Press, 1958); Richard Centers, The Psychology of Social Classes: a Study of Class Consciousness (Princeton, N.J.: Princeton University Press, 1949); W. Lloyd Warner and Paul S. Lunt, The Social Life of a Modern Community (New Haven: Yale University Press, 1941), pp. 378-450; and the numerous articles collected under sub-titles, "Patterns of Status," and "Differential Class Behavior," in Bendix and Lipset, Class, Status and Power, ed. Reinhard Bendix and Seymour Martin Lipset (Glencoe, Ill.: The Free Press, 1953), pp. 190-370.

TABLE 2.2.--Percentage distribution of persons 25 years of age and over by years of schooling, according to school districts and strata: Berkeley, 1950[a]

| School district<br>Stratum | No. of persons 25 years of age and over reporting | Years of schooling 0-7 | 8 | 9-11 | 12 | 13-15 | 16 and over |
|---|---|---|---|---|---|---|---|
| Cragmont | 4412 | 1% | 4% | 5% | 22% | 19% | 49% |
| Hillside | 5494 | 3 | 4 | 6 | 18 | 23 | 45 |
| John Muir | 3356 | 4 | 7 | 5 | 25 | 21 | 38 |
| Thousand Oaks | 3926 | 5 | 8 | 9 | 29 | 20 | 30 |
| Oxford | 2796 | 3 | 7 | 9 | 24 | 18 | 39 |
| Emerson | 5857 | 3 | 6 | 7 | 23 | 23 | 38 |
| Hills | 25841 | 3 | 6 | 7 | 23 | 21 | 40 |
| Whittier-University | 3952 | 7 | 10 | 10 | 27 | 18 | 28 |
| Le Conte | 7328 | 6 | 10 | 10 | 26 | 20 | 29 |
| Jefferson | 4920 | 11 | 13 | 14 | 29 | 16 | 18 |
| Washington | 6072 | 10 | 13 | 13 | 30 | 16 | 18 |
| Foothills | 22270 | 9 | 11 | 12 | 28 | 17 | 23 |
| Franklin | 7085 | 19 | 13 | 19 | 26 | 11 | 12 |
| Longfellow | 6019 | 20 | 16 | 17 | 27 | 10 | 10 |
| Lincoln | 5431 | 22 | 14 | 21 | 25 | 10 | 8 |
| Columbus | 3623 | 26 | 17 | 16 | 25 | 8 | 8 |
| Flats | 22159 | 21 | 15 | 18 | 26 | 10 | 9 |

[a] Calculated from U.S. Census of Population: 1950, loc. cit., III, chap. xlix, 19-21.

of the proportion of professional, technical, and kindred workers in the same district. The correlation between these percentages is illustrated in Fig. 2.2, below.

While Tables 2.1 and 2.2, and Fig. 2.2, show that there is a strong tendency for those in professional, managerial, and technical positions, having some college education or more, to settle in the Hills, and for manual workers, and those who have not completed high school, to settle in the Flats, high-school graduates are about equally distributed in the three strata--about a quarter of each stratum being composed of high-school graduates. The range of positions for this group, which is modal, and rapidly becoming minimal, is wider than for the others. A high-school diploma will no longer be associated with a white-collar occupation among the on-coming generation of students.

The segregation of non-whites, principally Negroes, is shown in Table 2.3. Almost all of the Negroes were concentrated in the Flats in 1950, where they constituted thirty-five per cent of the population. They were particularly concentrated in South Berkeley, along the Oakland border, where Lincoln and Longfellow Schools are located. West Berkeley was, at that time, predominantly white--with a high proportion of persons with Spanish surnames.[1]

The conditions of housing closely follow the educational and occupational dimensions of stratification. In Table 2.4 the average value of owner-occupied dwellings and dwellings for sale, and the average rents of

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[1] Census tracts 1-A and 1-B, in the extreme west of Berkeley, were the only tracts listed as having more than 250 white persons with Spanish surnames. (These tracts had 652 and 535, respectively.) U.S. Census of Population: 1950, loc. cit., III, chap. xlix, 81.

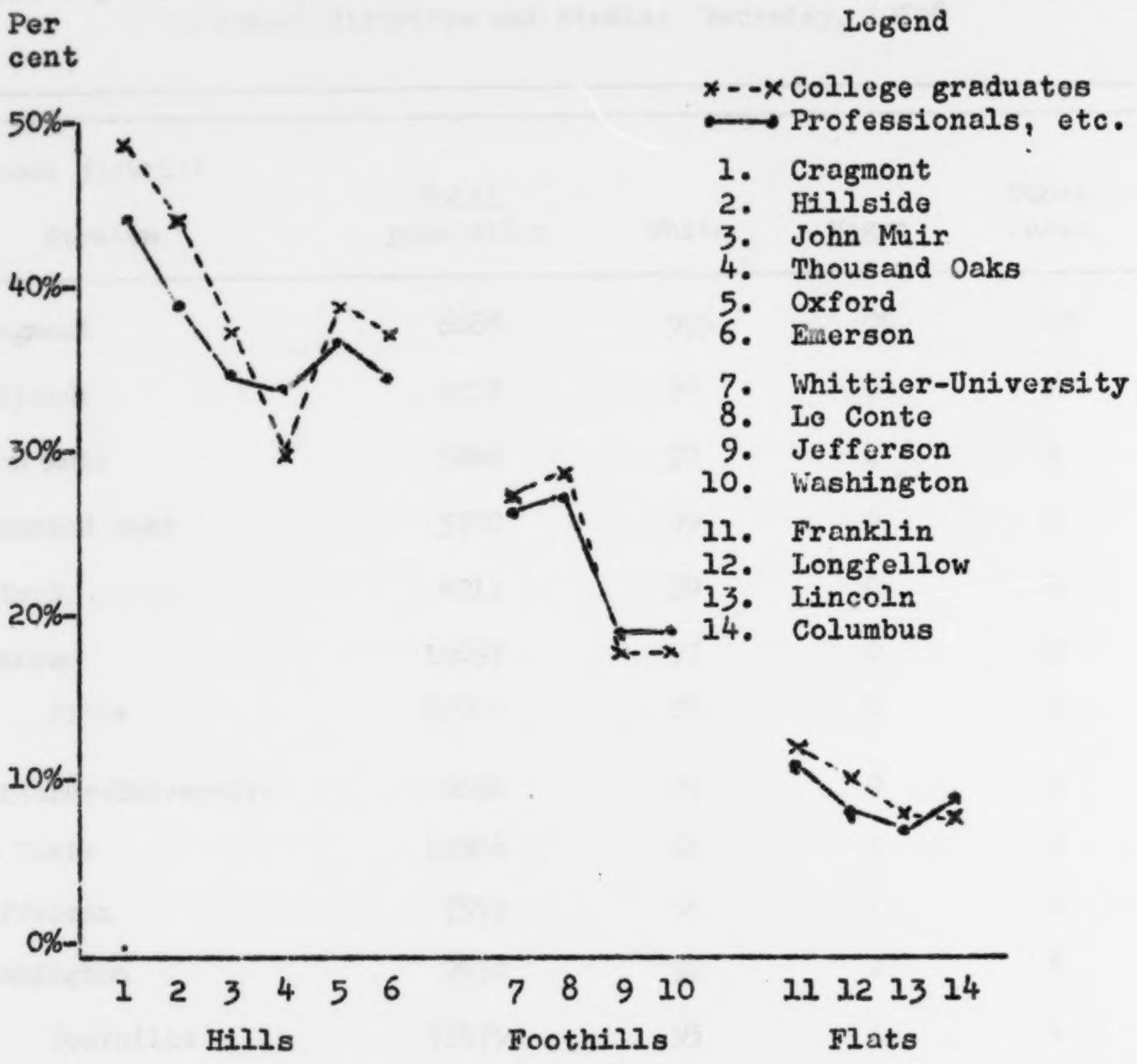

Fig. 2.2 --Relationship between the percentages of college graduates and of professional, technical, and kindred workers within school districts, by strata: Berkeley, 1950

TABLE 2.3.--Percentage distribution of the population by race, according to school districts and strata: Berkeley, 1950[a]

| School district<br>Stratum | Total population | White | Negro | Other races |
|---|---|---|---|---|
| Cragmont | 6688 | 99% | 0% | 1% |
| Hillside | 9978 | 97 | 0 | 2 |
| John Muir | 5246 | 97 | 1 | 2 |
| Thousand Oaks | 5780 | 99 | 0 | 0 |
| Oxford | 4211 | 99 | 0 | 1 |
| Emerson | 10097 | 97 | 0 | 2 |
| Hills | 42000 | 98 | 0 | 2 |
| Whittier-University | 6091 | 97 | 0 | 3 |
| Le Conte | 12386 | 96 | 1 | 3 |
| Jefferson | 7572 | 95 | 1 | 4 |
| Washington | 9430 | 92 | 2 | 6 |
| Foothills | 35479 | 95 | 1 | 4 |
| Franklin | 12643 | 72 | 23 | 6 |
| Longfellow | 9300 | 49 | 42 | 9 |
| Lincoln | 8702 | 35 | 60 | 5 |
| Columbus | 5689 | 85 | 11 | 3 |
| Flats | 36334 | 59 | 35 | 6 |

[a] Calculated from U.S. Census of Population: 1950, loc. cit., III, chap. xlix, 19-21.

TABLE 2.4.--Average values of dwelling units, and average rents, according to school districts and strata: Berkeley, 1950[a]

| School district<br>Stratum | Owner-occupied or for sale | | Renter-occupied or for rent | |
|---|---|---|---|---|
| | Number reporting | Average value | Number reporting | Average rent |
| Cragmont | 1663 | $18500 | 299 | $74 |
| Hillside | 610 | 18400 | 1861 | 56 |
| John Muir | 817 | 22000 | 702 | 59 |
| Thousand Oaks | 1522 | 15400 | 238 | 67 |
| Oxford | 773 | 14800 | 473 | 58 |
| Emerson | 621 | 17700 | 2034 | 55 |
| Hills | 6007 | 17600 | 5606 | 58 |
| Whittier-University | 553 | 10900 | 1452 | 52 |
| Le Conte | 733 | 11700 | 2783 | 50 |
| Jefferson | 1325 | 10500 | 1026 | 51 |
| Washington | 852 | 9200 | 2052 | 46 |
| Foothills | 3464 | 10500 | 7310 | 49 |
| Franklin | 1417 | 9000 | 2276 | 42 |
| Longfellow | 1439 | 9000 | 1181 | 44 |
| Lincoln | 898 | 8500 | 1347 | 43 |
| Columbus | 699 | 8000 | 903 | 42 |
| Flats | 4453 | 8800 | 5708 | 43 |

[a] Calculated from U.S. Census of Housing: 1950, loc. cit., p. 3.

those on the rental market have been calculated. This shows that the average value of the homes in the Hills is over twice as great as the value of those in the Flats. Contrasting the number of owner-occupied with renter-occupied homes in the various districts, we find that North Berkeley--Cragmont, Thousand Oaks, Oxford, and Jefferson districts--have the highest proportion of owner-occupied dwellings. Both the ring of districts surrounding the University, and the Flats, have a large proportion of renter-occupied dwellings. While the market value of these dwellings to some extent reflects non-material evaluations of exclusiveness and location, the relative inadequacy of the housing in the Flats is brought out by the crowded conditions of living illustrated in Table 2.5.

Some insight into the moral atmosphere of the neighborhoods is provided in Table 2.6, showing the distribution of juvenile probation cases by sex in the various school districts in 1951. The areal concentration of delinquency, poverty, minority status, and lack of social power, brought out by numerous studies,[1] is here reflected in the concentration of violations in the Flats. While girls offend less often than boys, especially in the Hills and Foothills, the difference between the sexes

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[1] See, e.g., Clifford R. Shaw and Henry D. McKay, Juvenile Delinquency and Urban Areas: a Study of Rates of Delinquents in Relation to Differential Characteristics of Local Communities in American Cities (Chicago: University of Chicago Press, 1942). The distribution of alleged delinquents in Berkeley during the years 1928-1932 was sparse in the Hills, and dense in the Flats, with a curious concentration adjacent to the University--in the Washington School district. See Herman Adler, Frances Cahn, and Johannes Stuart, The Incidence of Delinquency in Berkeley, 1928-1932, Publications of the Bureau of Public Administration, University of California (Berkeley: University of California Press, 1934).

TABLE 2.5.--Percentages of dwelling units which are crowded, according to school districts and strata: Berkeley, 1950[a]

| School district<br>Stratum | Number of occupied dwelling units | Per cent of dwelling units with 1.01 or more occupants per room |
|---|---|---|
| Cragmont | 2130 | 1% |
| Hillside | 2764 | 4 |
| John Muir | 1703 | 2 |
| Thousands Oaks | 1868 | 1 |
| Oxford | 1398 | 3 |
| Emerson | 2294 | 3 |
| Hills | 12856 | 2 |
| Whittier-University | 2300 | 5 |
| Le Conte | 3970 | 5 |
| Jefferson | 2639 | 4 |
| Washington | 3264 | 6 |
| Foothills | 12171 | 5 |
| Franklin | 4001 | 14 |
| Longfellow | 2977 | 10 |
| Lincoln | 2668 | 13 |
| Columbus | 1854 | 11 |
| Flats | 11500 | 12 |

[a] Calculated from U.S. Census of Population: 1950, loc. cit., III, chap. xlix, 64-66.

TABLE 2.6.--Rates of formal and informal active juvenile probation cases by sex, according to school districts and strata: Berkeley, 1951[a]

| School district<br>Stratum | Number of boys under 18 years of age | Rate per 1000 boys under 18 | Number of girls under 18 years of age | Rate per 1000 girls under 18 |
|---|---|---|---|---|
| Cragmont | 859 | 4.6 | 790 | 1.9 |
| Hillside | 587 | 7.4 | 567 | 0.1 |
| John Muir | 538 | 16.9 | 519 | 0.8 |
| Thousand Oaks | 688 | 1.7 | 675 | 0.6 |
| Oxford | 423 | 8.3 | 472 | 3.4 |
| Emerson | 652 | 7.9 | 627 | 1.9 |
| Hills | 3747 | 7.3 | 3650 | 1.4 |
| Whittier-University | 551 | 6.0 | 521 | 1.5 |
| Le Conte | 852 | 9.9 | 817 | 3.0 |
| Jefferson | 882 | 8.8 | 906 | 2.7 |
| Washington | 839 | 8.4 | 801 | 3.3 |
| Foothills | 3124 | 8.5 | 3045 | 2.7 |
| Franklin | 1978 | 16.5 | 1930 | 10.5 |
| Longfellow | 1174 | 15.8 | 1075 | 12.7 |
| Lincoln | 1057 | 15.7 | 1043 | 7.2 |
| Columbus | 747 | 10.1 | 717 | 14.3 |
| Flats | 4955 | 15.2 | 4765 | 10.8 |

[a] Calculated from Martin Wolins, *Welfare Problems and Services in Berkeley, California: Report of the Community Welfare Study: Supplement* (Berkeley Council of Social Welfare and School of Social Welfare, University of California, June, 1954), p. 33. (Mimeographed.) Wolins' sources were the Alameda County Probation Department, Juvenile Division, and *U.S. Census of Population: 1950*, *loc. cit.*, III, chap. xlix, 45-48.

is not large in the Flats. In Columbus district there were even more cases among the girls than the boys in 1951. Parental supervision, and the expectation of docility and "femininity", is stronger among the middle classes.[1]

While in 1950 most of the Negroes in Berkeley were concentrated along the Oakland border of the Flats, the composition of the student bodies in the high-sixth grades in 1959 reflects a large influx of this group, making the schools in the Flats more homogeneously Negro, and spreading into the Foothills. The higher fertility rates among the working-class Negroes may explain a portion of the higher proportion of Negro children in the Flats in 1959 than Negroes in the total population in 1950. But to a larger extent this reveals a change in the over-all composition of the population. The influx of working-class Negroes from the South and Southwest into California during World War II and the post-war decade has given rise to an ecological polarization in Berkeley. As Negroes have threatened to become a majority in a neighborhood, the flight of whites to suburbs and exclusive residential areas is accelerated. A consequence of this polarization is that the school districts have become even more sharply segregated than before. With the concommitant growth of the University during this period, the Hills have an even higher proportion of professionals. The proportion of manual workers in the Flats rose from 68% in 1950 to 82% in 1959 (as indicated by the

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[1] See, e.g., Talcott Parsons, "Age and Sex in the Social Structure of the United States," Personality in Nature, Society, and Culture, ed. Clyde Kluckhohn and Henry A. Murray (2d ed., rev. and enl.; New York: Alfred A. Knopf, 1956), pp. 363-75; James H. S. Bossard, The Sociology of Child Development (rev. ed.; New York: Harper & Brothers, 1954), p. 349.

TABLE 2.7.--Percentage distribution of high-sixth-grade students by race, according to schools and strata: Berkeley, 1959[a]

| School<br>Stratum | Number of students responding[b] | White | Negro | Oriental |
|---|---|---|---|---|
| Cragmont | 97 | 96% | 1% | 3% |
| Hillside | 65 | 97 | 2 | 2 |
| John Muir | 31 | 100 | 0 | 0 |
| Thousand Oaks | 59 | 97 | 0 | 3 |
| Oxford | 34 | 97 | 0 | 3 |
| Emerson | 30 | 97 | 0 | 3 |
| Hills | 316 | 97 | 1 | 3 |
| Whittier-University | 38 | 89 | 3 | 8 |
| Le Conte | 61 | 64 | 25 | 11 |
| Jefferson | 70 | 80 | 10 | 10 |
| Washington | 60 | 65 | 15 | 20 |
| Foothills | 229 | 73 | 14 | 13 |
| Franklin | 69 | 33 | 49 | 17 |
| Longfellow | 66 | 6 | 88 | 6 |
| Lincoln | 53 | 4 | 83 | 13 |
| Columbus | 59 | 51 | 44 | 5 |
| Flats | 247 | 24 | 66 | 11 |

[a] Data for this, and subsequent tables describing high-sixth-grade students in Berkeley, 1959, are from the survey described in Appendixes A and B.

[b] There were 816 high-sixth-grade students enrolled in the Berkeley Public Schools in the spring of 1959 at the time of the survey. Of the 24 non-respondents to this question, 1 was in the Hills, 7 were in the Foothills, and 16 were in the Flats. This skewing of non-responses toward the lower end of most dimensions of stratification is a pattern found throughout this study. The rate of non-responses, however, is low enough so as not to vitiate the differences between groups.

TABLE 2.8.--Percentage distribution of fathers of high-sixth-grade students in occupational groups, according to schools and strata: Berkeley, 1959

| School<br>Stratum | No. of fathers for whom information was available | Occupational groups[a] | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 |
| Cragmont | 95 | 49% | 20% | 7% | 20% | 3% | 0% |
| Hillside | 61 | 51 | 11 | 20 | 15 | 3 | 0 |
| John Muir | 31 | 32 | 26 | 19 | 19 | 3 | 0 |
| Thousand Oaks | 55 | 40 | 5 | 16 | 29 | 7 | 2 |
| Oxford | 34 | 65 | 15 | 3 | 15 | 3 | 0 |
| Emerson | 28 | 32 | 18 | 14 | 29 | 7 | 0 |
| Hills | 304 | 46 | 15 | 13 | 21 | 4 | 0 |
| Whittier-University | 32 | 19 | 0 | 9 | 22 | 31 | 19 |
| Le Conte | 55 | 18 | 2 | 11 | 18 | 22 | 29 |
| Jefferson | 70 | 16 | 4 | 6 | 33 | 23 | 19 |
| Washington | 54 | 7 | 4 | 2 | 28 | 46 | 13 |
| Foothills | 211 | 15 | 3 | 7 | 26 | 30 | 20 |
| Franklin | 58 | 2 | 0 | 3 | 12 | 33 | 50 |
| Longfellow | 53 | 2 | 0 | 0 | 23 | 32 | 43 |
| Lincoln | 44 | 2 | 0 | 2 | 11 | 39 | 45 |
| Columbus | 57 | 0 | 0 | 2 | 14 | 28 | 56 |
| Flats | 212 | 1 | 0 | 2 | 15 | 33 | 49 |

[a] The occupational groups are:

1. Professional.
2. Executive.
3. Merchant: self-employed.
4. White collar.
5. Skilled manual workers and self-employed artisans.
6. Semi- and unskilled manual workers.

distribution of the school population); and where the proportion of those classified by the census as professionals, and as managers, officials, and proprietors, was 18% in 1950, only 3% of the students in that area fell into the most comparable categories in 1959.[1]

The education of the parents of the students, shown in Table 2.9, shows a pattern similar to that of the census figures except that the average is raised throughout--probably more than the increasing education of the population in general warrants. These data come from the responses of the students on questionnaires, and, unlike the data on the fathers' occupations, are not substantiated by other sources. In many cases the students may not know their parents' schooling, and may make ego-enhancing guesses. This invalidity should not seriously affect the use of these data in multivariate analysis, however, because the unlikely combinations--manual workers with college degrees or professionals who have not been to college--will drop out for want of numbers. In any event, where the parents' formal schooling is to be construed as a reference for the child's expectations, the child's impression or wishful thinking may be as significant as the fact.

The entire set of tables thus far presented serve to confirm that on many dimensions of stratification the population of Berkeley, and its

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[1] These classifications are not strictly comparable. The categories of "operative, laborer, . . ." are, however, comparable with the category of "semi- and un-skilled manual workers." It is highly unlikely that only one child in this category should be found among a group of 304 in the Hills if the proportion in the population were .14, as in Table 2.1. (The alternative explanation--that manual workers residing in the Hills are childless--does not seem plausible.)

TABLE 2.9.--Percentage distribution of parents of high-sixth-grade students in educational categories, as reported by the students, according to schools and strata: Berkeley, 1959

| School<br>Stratum | No. of parents[a] for whom students responded | Years of schooling | | | | | |
|---|---|---|---|---|---|---|---|
| | | 0-7 | 8 | 9-11 | 12 | 13-15 | 16 and over |
| Cragmont | 180 | 0% | 0% | 1% | 11% | 10% | 79% |
| Hillside | 124 | 0 | 1 | 0 | 10 | 11 | 78 |
| John Muir | 60 | 0 | 0 | 2 | 12 | 13 | 73 |
| Thousand Oaks | 107 | 1 | 0 | 6 | 19 | 18 | 57 |
| Oxford | 67 | 0 | 0 | 3 | 7 | 4 | 85 |
| Emerson | 55 | 0 | 0 | 2 | 11 | 24 | 64 |
| Hills | 593 | 0 | 0 | 2 | 12 | 13 | 74 |
| Whittier-University | 63 | 0 | 3 | 11 | 29 | 13 | 44 |
| Le Conte | 101 | 4 | 1 | 7 | 38 | 14 | 37 |
| Jefferson | 116 | 3 | 4 | 7 | 35 | 16 | 34 |
| Washington | 107 | 7 | 5 | 10 | 36 | 21 | 22 |
| Foothills | 387 | 4 | 3 | 9 | 35 | 16 | 33 |
| Franklin | 109 | 6 | 6 | 14 | 28 | 10 | 35 |
| Longfellow | 107 | 6 | 2 | 16 | 33 | 17 | 27 |
| Lincoln | 81 | 5 | 4 | 11 | 31 | 16 | 33 |
| Columbus | 103 | 17 | 6 | 15 | 38 | 9 | 17 |
| Flats | 400 | 8 | 4 | 14 | 32 | 13 | 28 |

[a] This number includes both the father and mother of each respondent, thus doubling the possible size of the sample.

schools, fall into three major strata. While there are variations within strata, they are insignificant as contrasted with the variation between strata. Taking the fundamental dichotomy between manual and non-manual workers, and plotting the number of fathers in each category at each school on binomial probability paper,[1] in Fig. 2.3, provides a rough-and-ready analysis of variance: showing graphically both the homogeneity of the schools within strata and the differences between strata.

Because of this homogeneity within strata, and in order to increase the number of cases available in each group when assessing the effects of the milieu upon students' achievement and aspirations, the populations of the schools within each stratum have been pooled for the subsequent analysis.

In Table 2.10 the gross differences between strata according to several variables are summarized. The differences between the compositions of the strata with respect to parents' occupations and educations, and the extent of segreation by race, have already been shown in detail. Religious

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[1] Frederick Mosteller and John W. Tukey, "The Uses and Usefulness of Binomial Probability Paper," Journal of the American Statistical Association, XLIV (June, 1949), 174-212. Each line in Fig. 2.3 represents the over-all proportion of manual workers in a school stratum, and each plot, the proportion at an individual school. (The number of manual workers' children are counted on the horizontal axis, and the non-manual workers' children on the vertical axis.) The vertical distances from plots to a line are read as multiples of the standard deviations of the individual proportions. (One standard deviation is approximately 5 mm.; the "full scale of individual standard errors," produced below the chart, may be used for estimation.) All the school plots are within two standard deviations of their assigned stratum proportion, and, at the same time, are four or more standard deviations away from any other stratum proportion.

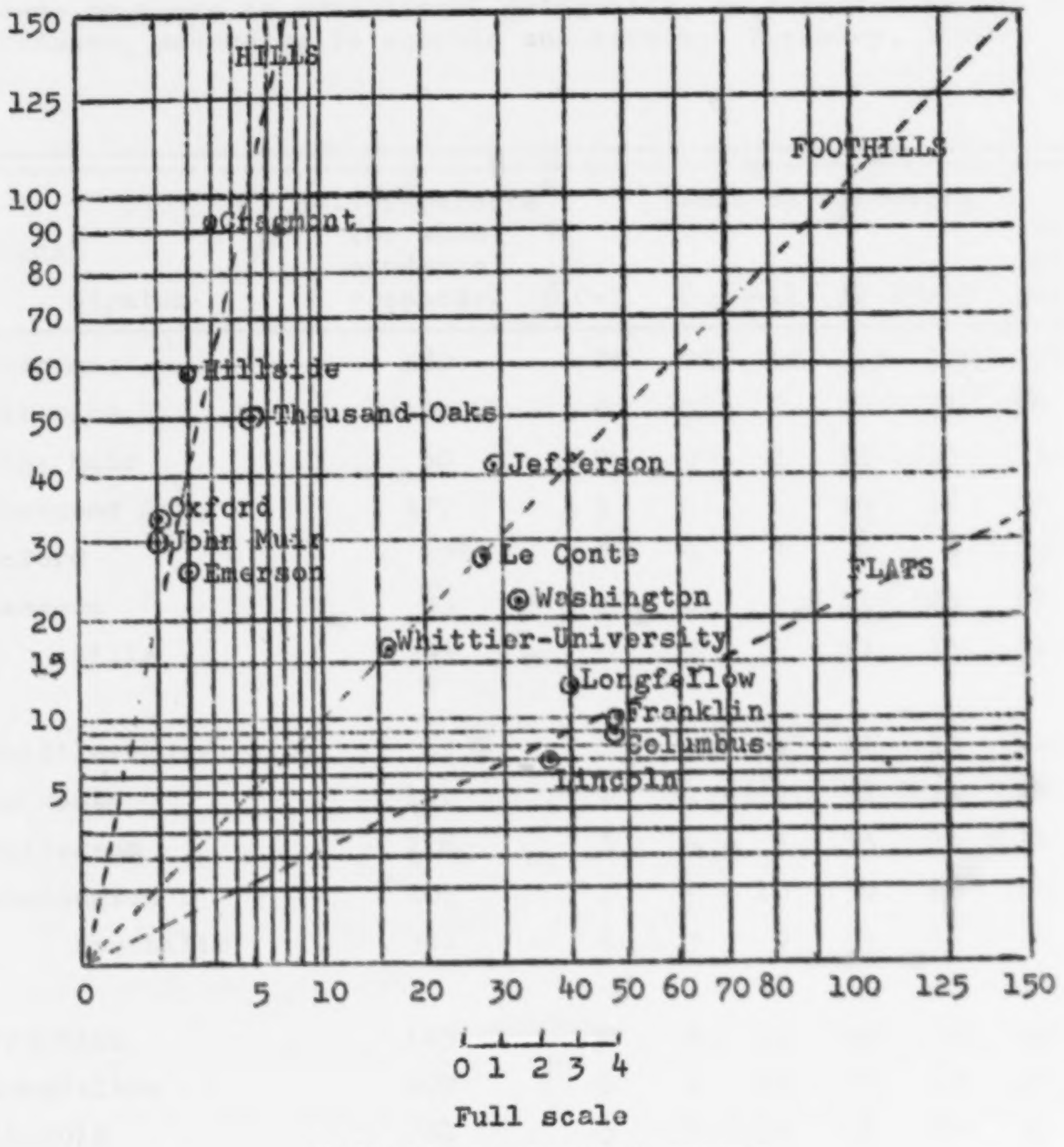

Fig. 2.3--Frequency distribution of manual and nonmanual fathers of high-sixth-grade students, plotted on binomial probability paper by schools and strata: Berkeley, 1959

TABLE 2.10.--Percentage distribution of parents of high-sixth-grade students in educational categories, as reported by the students, according to schools and strata: Berkeley, 1959

| School<br>Stratum | No. of parents[a] for whom students responded | Years of schooling | | | | | |
|---|---|---|---|---|---|---|---|
| | | 0-7 | 8 | 9-11 | 12 | 13-15 | 16 and over |
| Cragmont | 180 | 0% | 0% | 1% | 11% | 10% | 79% |
| Hillside | 124 | 0 | 1 | 0 | 10 | 11 | 78 |
| John Muir | 60 | 0 | 0 | 2 | 12 | 13 | 73 |
| Thousand Oaks | 107 | 1 | 0 | 6 | 19 | 18 | 57 |
| Oxford | 67 | 0 | 0 | 3 | 7 | 4 | 85 |
| Emerson | 55 | 0 | 0 | 2 | 11 | 24 | 64 |
| Hills | 593 | 0 | 0 | 2 | 12 | 13 | 74 |
| | | | | | | | |
| Whittier-University | 63 | 0 | 3 | 11 | 29 | 13 | 44 |
| Le Conte | 101 | 4 | 1 | 7 | 38 | 14 | 37 |
| Jefferson | 116 | 3 | 4 | 7 | 35 | 16 | 34 |
| Washington | 107 | 7 | 5 | 10 | 36 | 21 | 22 |
| Foothills | 387 | 4 | 3 | 9 | 35 | 16 | 33 |
| | | | | | | | |
| Franklin | 109 | 6 | 6 | 14 | 28 | 10 | 35 |
| Longfellow | 107 | 6 | 2 | 16 | 33 | 17 | 27 |
| Lincoln | 81 | 5 | 4 | 11 | 31 | 16 | 33 |
| Columbus | 103 | 17 | 6 | 15 | 38 | 9 | 17 |
| Flats | 400 | 8 | 4 | 14 | 32 | 13 | 28 |

[a] This number includes both the father and mother of each respondent, thus doubling the possible size of the sample.

affiliations are also associated with socioeconomic status.[1] Most of the Jewish population is concentrated in the Hills (largely in the university community); Catholics, being more numerous among manual workers, are rarer in the Hills; Negro Baptists are found concentrated in the Flats. Religious participation, interestingly, is more regular among the lower strata, and thus in the Flats.[2]

Data reflecting the greater rate of interstate migration, particularly from the South, into the Flats, is also summarized at the bottom of Table 2.10. Almost one-half of the fathers in the Hills have lived in California for over twenty-five years, while less than a third of those in the Flats have been in the state that long.

While the geographic cleavage between social strata is sharp, it is not complete. There are a number of children of professionals, and of manual workers, living in the Foothills; and there are children from intermediate non-manual groups in all three geographic areas. How does the social composition of the school affect the expectations, norms, and achievement of students within the school? Will the children of white-collar workers attending a school comprised largely of the children of manual workers have lower expectations and achieve more poorly, on the average, than their compeers in the Hills? These questions are considered in the following chapters.

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[1] Cf., Liston Pope, "Religion and the Class Structure," Class, Status and Power, op. cit., pp. 316-23.

[2] There have been numerous intimations in sociological literature that religous participation compensates for the absence of social status and power. See, e.g., Charles Y. Glock, "The Sociology of Religion," Sociology Today: Problems and Prospects, ed. Robert K. Merton, Leonard Broom, and Leonard S. Cottrell, Jr. (New York: Basic Books, Inc., 1959), p. 171; J. Milton Yinger, Religion, Society and the individuals: an Introduction to the Sociology of Religion (New York: The Macmillan Company, 1957), pp. 73-124.

## III. ACADEMIC ACHIEVEMENT BY SCHOOL STRATA

Despite diversity and conflict concerning the proper ends of education, imparting facility with letters and ciphers has always been the central business of the elementary school. Fluency in reading and competence in arithmetic computation are the primary considerations according to which students are assessed as good or poor. Their grades, test scores, teachers' recommendations, or other evidences of achievement mark them for differentiated curricula in high school, where, in turn, they are sorted into different streams of life. While there are "late bloomers" and fading prodigies, ordinarily progression from year to year is continuous and self-consistent. Differentiated tasks and expectations, groupings within classrooms or divisions between classrooms, "normalization" of past achievement by teachers, parents, peers, and self--the development of a self-image,--support and enforce this continuity.

While past performance serves as a reference by which to guage future expectations, both for the individual himself and for others, other norms impinge upon this judgment and partially account for the variation between individuals in levels of achievement. Girls, on the average, for example, are more competent than boys in school tasks. However much rapidity of physical growth, cultural expectations of docility, and differential socialization leading to greater linguistic facility, may account for these average differences, the fact of a higher norm creates a role expectation for school girls which is higher than for boys, impinging upon them as girls. Failure to achieve leads to greater frustration and greater effort on the part of girls: the fact becomes a self-fulfilling prophecy.

Cross-cutting the sexual role is the student's identification with his family--his adoption of their values, aspirations, and expectations--with the consequence of intergenerational inheritance. The joint effect of these identifications upon school achievement is illustrated in Table 3.1, where mean California Reading Achievement Test scores are tabulated for high-sixth-grade boys and girls in Berkeley, according to their fathers' occupations.

TABLE 3.1--Mean California Reading Achievement Test scores by sex and fathers' occupations: high-sixth-grade students, Berkeley, 1959

| Father's occupation | Boys | Girls | Total |
|---|---|---|---|
| Professional & executive | 105<br>(117) | 107<br>(109) | 106<br>(226) |
| White collar & merchant | 97<br>(95) | 99<br>(109) | 98<br>(204) |
| Manual & artisan | 80<br>(130) | 89<br>(144) | 84<br>(274) |
| All occupations[a] | 92<br>(387) | 95<br>(403) | 94<br>(790) |

[a] The bases of the totals add up to more than the bases of the subcategories because those for whom no information was available on the control variable (occupation) are not shown. They are excluded because, strictly speaking, they do not constitute a controlled group, and a comparison is not meaningful.

In the right-hand margin of Table 3.1 we see the relative advantages provided by families of varying strata, in the lower margin, the over-all difference between boys and girls (which, though consistent, is surprisingly small--most tabulations of this comparison reveal larger differences). Within the body of the table we see how these two factors mutually sustain or conflict with each other.

Since girls do achieve more highly than boys, and their educational and occupational aspirations are so different, merging the two sexes would result in uncontrolled variation in the tabulations, blurring the effects of other factors. The boys alone, therefore, will be considered in the subsequent analysis.

Breaking the occupational classifications of Table 3.1 into finer detail, Table 3.2 shows the differences between the boys in various occupational groups in achievement reflected by several indexes. Teachers were asked to go through their class lists and check those who were outstanding--to whom they would assign A or B grades--in reading and in arithmetic. In general, the higher occupational groups received a higher proportion of checks in each subject. Two-thirds of the children of professionals, executives, and merchants were checked, while only one-fourth of the children of manual workers were checked. That these teachers' assessments do not rest solely on attributive bias is shown in the mean achievement test scores of the last three columns. Measured achievement in reading, arithmetic, and "mental maturity"--a combination of the two--indicates a comparable regression.

The force of these distinctions, their impact upon the students' future schooling (e.g., their assignment to groups the following year in junior high school), is most clearly revealed by the percentage of students reading at grade level--in a high-sixth-grade reader--in April, near the end of the year. While ninety per cent of the upper strata were reading at grade level, only one-third of the children of semi- or unskilled manual laborers were.

TABLE 3.2--Teacher and test indications of academic achievement by fathers' occupations: high-sixth-grade boys, Berkeley, 1959

| | Achievement variables[a] | | | | | |
|---|---|---|---|---|---|---|
| Father's occupation | 1 | 2 | 3 | 4 | 5 | 6 |
| Executive | 73%<br>(26) | 65%<br>(26) | 92%<br>(26) | 106<br>(25) | 81<br>(25) | 125<br>(23) |
| Professional | 67<br>(93) | 56<br>(93) | 91<br>(93) | 105<br>(92) | 82<br>(88) | 126<br>(74) |
| Merchant: self-employed | 63<br>(30) | 67<br>(30) | 90<br>(30) | 105<br>(29) | 83<br>(29) | 125<br>(26) |
| Upper white collar | 54<br>(37) | 46<br>(37) | 84<br>(37) | 101<br>(37) | 79<br>(34) | 122<br>(32) |
| Lower white collar | 32<br>(31) | 29<br>(31) | 65<br>(31) | 84<br>(29) | 63<br>(29) | 107<br>(27) |
| Artisan: self-employed | 39<br>(18) | 61<br>(18) | 39<br>(18) | 88<br>(17) | 66<br>(18) | 114<br>(16) |
| Skilled manual | 27<br>(48) | 31<br>(48) | 42<br>(45) | 84<br>(43) | 59<br>(42) | 103<br>(35) |
| Semi- and unskilled manual | 11<br>(75) | 20<br>(75) | 33<br>(72) | 75<br>(70) | 55<br>(66) | 101<br>(55) |
| All occupations | 42%<br>(405) | 42%<br>(405) | 65%<br>(396) | 92<br>(387) | 69<br>(377) | 114<br>(327) |

[a] The indexes of achievement are as follows:

1. Percentages to whom teachers would assign A or B grades in reading.
2. Percentages to whom teachers would assign A or B grades in arithmetic.
3. Percentages reading at grade level (in a high-sixth-grade reader) in April.
4. Mean California Reading Achievement Test scores.
5. Mean California Arithmetic Achievement Test scores.
6. Mean California Mental Maturity Test (IQ) scores.

The students are subject not only to varying home influences, which have been roughly represented by their fathers' occupations, but also perform their studies in different school environments. We have seen, in chapter two, the extent to which the compositions of the schools vary between strata. The crux of our question is the extent to which these varying school milieux modify the performance of the students within them. We know that the children of professionals are concentrated in the Hills schools, and children of manual workers in the Flats. In light of the demonstrated association between familial stratification and achievement, we can be sure that the norm of achievement is higher in the Hills. Does this variation in regional norms serve as a significant reference for the students?

Considering reading achievement first, in Table 3.3, we find that the mean of test scores in the Hills was 106, in the Foothills 92, and 73 in the Flats. Vertical comparisons within the table reflect the higher achievement of higher occupational strata within each school stratum. But horizontal comparisons show much larger discrepancies between children from roughly comparable familial strata in the different school strata. The children of professionals in the Foothills attained a poorer average than their compeers in the Hills; the children of manual workers in the Foothills, almost equalling the white-collar group in the same schools, were far superior to those in the Flats.

Looking at the reading level in which the children were placed, in Table 3.4, we see that in the Hills only five children were not reading at grade level, and that they were within one year of grade level. (It is interesting that not one of the three children of manual workers in the Hills were among these five.) In the Foothills, and especially in the

TABLE 3.3--Mean California Reading Achievement Test scores by fathers' occupations and school strata: high-sixth-grade boys, Berkeley, 1959

| Father's occupation | School stratum<br>Hills | <br>Foothills | <br>Flats |
|---|---|---|---|
| Professional & executive | 107<br>(94) | 100<br>(21) | ---[a]<br>(2) |
| White collar & merchant | 106<br>(46) | 93<br>(31) | 81<br>(18) |
| Manual & artisan | ---[a]<br>(3) | 91<br>(55) | 71<br>(72) |
| All occupations | 106<br>(148) | 92<br>(121) | 73<br>(118) |

[a] Means are not reported for groups so small that the figures would only be misleading or distracting. Dashes in place of means or percentages in subsequent tables are for the same reason.

TABLE 3.4--Frequency distribution of reading grade placements by fathers' occupations and school strata: high-sixth-grade boys, Berkeley, 1959

| School stratum<br>Father's occupation | N | Primer to L-3 | H-3 L-4 | H-4 L-5 | H-5 L-6 | H-6 |
|---|---|---|---|---|---|---|
| Hills | | | | | | |
| Professional & executive | 95 | 0 | 0 | 0 | 2 | 93 |
| White collar & merchant | 47 | 0 | 0 | 0 | 3 | 44 |
| Manual & artisan | 3 | 0 | 0 | 0 | 0 | 3 |
| Foothills | | | | | | |
| Professional & executive | 22 | 0 | 2 | 1 | 4 | 15 |
| White collar & merchant | 31 | 2 | 3 | 1 | 6 | 19 |
| Manual & artisan | 57 | 2 | 7 | 3 | 21 | 24 |
| Flats | | | | | | |
| Professional & executive | 2 | 0 | 0 | 0 | 1 | 1 |
| White collar & merchant | 20 | 2 | 1 | 0 | 2 | 15 |
| Manual & artisan | 75 | 5 | 11 | 14 | 22 | 23 |

Flats, we see that sixth-grade boys are scattered out in readers as low as the first and second grade levels. The percentages reading at grade level are summarized in Table 3.5. While many more manual workers' than non-manual workers' sons are retarded in the Foothills and Flats, the differences between school strata, nevertheless, are dramatic. Virtually all of the children of professionals and white-collar workers alike are reading at grade level in the Hills, but a third of the children in these strata in the Foothills, and a quarter of them in the Flats, are retarded.

TABLE 3.5--Percentages reading at grade level by fathers' occupations and school strata: high-sixth-grade boys, Berkeley, 1959

| Father's occupation | School stratum<br>Hills | <br>Foothills | <br>Flats |
|---|---|---|---|
| Professional & executive | 98%<br>(95) | 68%<br>(22) | ---<br>(2) |
| White collar & merchant | 94<br>(47) | 61<br>(31) | 75%<br>(20) |
| Manual & artisan | ---<br>(3) | 42<br>(57) | 31<br>(75) |
| All occupations | 97%<br>(150) | 50%<br>(125) | 40%<br>(121) |

The proportion of students whom teachers cite as outstanding in each school stratum, according to familial strata, in Table 3.6, shows a rather similar pattern to the reading test scores and reading level assignments. But there is an interesting exception. Even though we know from Tables 3.3 and 3.5 that the mean achievement is lower, and the rate of retardation

TABLE 3.6--Percentages of high-sixth-grade boys indicated as superior in reading, by fathers' occupations and school strata: Berkeley, 1959

| Father's occupation | School stratum<br>Hills | <br>Foothills | <br>Flats |
|---|---|---|---|
| Professional & executive | 67%<br>(95) | 68%<br>(22) | ---<br>(2) |
| White collar & merchant | 53<br>(47) | 52<br>(31) | 40%<br>(20) |
| Manual & artisan | ---<br>(3) | 28<br>(58) | 14<br>(80) |
| All occupations | 61%<br>(150) | 41%<br>(126) | 21%<br>(129) |

higher, in the Foothills than in the Hills among the professional and white collar groups, the teachers, in these two strata, evaluate equivalent proportions as outstanding readers, meriting A or B grades. This seems to indicate that the different norms in the two strata affect the perception of excellence on the part of the teacher. In contrast to the performance of most of the children of manual workers, the performance of many non-manual workers' children seems good in the eyes of their teachers in the Foothills, although it does not measure up to the performance of the children in the Hills. The normalization of a lower standard of performance in the less-favored stratum provides the same circular reinforcement for the group that the normalization of past performance does for the individual.

To confirm that teachers in the different strata use differing norms in evaluating students, the reading test scores of those assigned A or B grades in reading are tabulated in Table 3.7. While the differences between strata are not large, they are systematic. The students who are

TABLE 3.7--Mean California Reading Achievement Test scores, by fathers' occupations and school strata, among high-sixth-grade boys designated as outstanding readers by their teachers: Berkeley, 1959

| Father's occupation | School stratum<br>Hills | <br>Foothills | <br>Flats |
|---|---|---|---|
| Professional & executive | 111<br>(63) | 106<br>(14) | ---<br>(2) |
| White collar & merchant | 111<br>(24) | 108<br>(16) | ---<br>(6) |
| Manual & artisan | ---<br>(1) | 107<br>(16) | 98<br>(10) |
| All occupations | 111<br>(90) | 105<br>(51) | 97<br>(24) |

considered outstanding in the Foothills and Flats do not achieve as highly, on the average, as do the run-of-the-mill students in the Hills.

Achievement in arithmetic, by school and familial strata, reveals the same patterns as does achievement in reading. In Table 3.8 we see, again, that performance is highest in the Hills, lower in the Foothills, and lowest in the Flats for each occupational group. The teachers' evaluations

TABLE 3.8--Mean California Arithmetic Achievement Test scores by fathers' occupations and school strata: high-sixth-grade boys, Berkeley, 1959

| Father's occupation | School stratum<br>Hills | <br>Foothills | <br>Flats |
|---|---|---|---|
| Professional & executive | 84<br>(92) | 72<br>(19) | ---<br>(2) |
| White collar & merchant | 81<br>(46) | 73<br>(27) | 64<br>(19) |
| Manual & artisan | ---<br>(3) | 64<br>(56) | 52<br>(67) |
| All occupations | 83<br>(146) | 67<br>(117) | 54<br>(114) |

of arithmetic performance, shown in Table 3.9, shows a similar pattern. Inasmuch as evaluation in arithmetic is less impressionistic and more standardized than evaluation of reading competence, the teachers in the Foothills do not claim as many students warranting high grades as in the Hills.

TABLE 3.9--Percentages of high-sixth-grade boys indicated as superior in arithmetic, by fathers' occupations and school strata: Berkeley, 1959

| Father's occupation | School strata<br>Hills | <br>Foothills | <br>Flats |
|---|---|---|---|
| Professional & executive | 60%<br>(95) | 55%<br>(22) | ---<br>(2) |
| White collar & merchant | 51<br>(47) | 45<br>(31) | 40%<br>(20) |
| Manual & artisan | ---<br>(3) | 47<br>(58) | 16<br>(80) |
| All occupations | 56%<br>(150) | 50%<br>(126) | 19%<br>(129) |

Taking the California Mental Maturity Test scores as a further indication of general academic achievement, and looking, in Table 3.10, at the joint effect of familial and school stratification, we see again the now familiar pattern. Groups of students from like familial strata have mean differences ranging around eight "IQ" points when attending schools in different strata.

TABLE 3.10--Mean California Mental Maturity (IQ) Test scores by fathers' occupations and school strata: high-sixth-grade boys, Berkeley, 1959

| Father's occupation | School stratum<br>Hills | <br>Foothills | <br>Flats |
|---|---|---|---|
| Professional & executive | 127<br>(80) | 118<br>(17) | ---<br>(0) |
| White collar & merchant | 124<br>(42) | 114<br>(26) | 109<br>(17) |
| Manual & artisan | ---<br>(3) | 107<br>(48) | 99<br>(55) |
| All occupations | 126<br>(130) | 112<br>(104) | 101<br>(93) |

In the series of tables presented thus far in this chapter we have seen that the academic achievement of boys from like occupational strata tends to regress toward the norm of the school in which they are enrolled. It is a commonplace of observation that middle-class parents articulate more concern, and place more pressure on school personnel, than do working-class parents for the academic success of their progeny. We have also presented some evidence that the teachers in less-favored schools tend to normalize the achievement of their students: to expect less of them. Later, in chapter five, evidence will be adduced to show that educational values are communicated laterally, between boys, especially in the Flats, tending to restrict performance. The behavior and interests of peers provide a pressure toward conformity, just as sexual and familial identifications.

Before considering the next topic, however, a complication in this model of cross-cutting reference groups must be considered. It has been suggested that the status--and model--of the family are represented by gross classification into occupational groups. However, ethnicity, the parents' education, their income, their tastes and values, and other dimensions along which individuals might be stratified, while correlated with occupation, are to some degree independent. These occupational brackets, themselves, are broad. It might well be that prosperous merchants and successful brokers live in the Hills, while sales clerks and stenographers live in the Foothills and Flats; that doctors and lawyers live in the Hills, while ministers in fundamentalist denominations --who are called rather than trained to their vocation--live in the Flats. The equation of these groups would be misleading.

While data are not available on all relevant ways in which families might be distinguished, it may be argued that if such distinctions in fact account for the differences between the boys in different schools, the introduction of some relevant controls should tend to diminish, though perhaps not eliminate, the differences in average achievement between school strata. The most relevant variables for which data are available in this study are race, and the educational status of each parent. A high rate of mortality accompanies the progressive introduction of additional variables in multivariate tabulations, in part because a few individuals must be dropped for want of data on some variable, but more severely because the repeated sub-division of groups results in categories with few or no cases. Tabulating by trichotomies: race, school strata, fathers' occupations, fathers' educations, and mothers' educations, results in a 3x3x3x3x3 = 243-cell table, into which only 405 boys--minus those for whom data is unavailable on any variables, including the respective dependent variables indicating academic achievement--must be distributed. This analysis was performed for each of the indexes of achievement used in this chapter. In each case only one modal combination was available in sufficient numbers to warrant a comparison between two school strata: the sons of Caucasian professionals and executives, both of whose parents had some college or more.

The comparisons between these matched groups in the Hills and in the Foothills are presented in Table 3.11. In five of the six indexes of academic achievement, rather than diminishing the difference between groups, the homogenization of the groups has enhanced the difference between them. That is, for example, where the mean IQ scores of all of the sons of professionals and executives in the Hills (reported in Table 3.10) was 127, and the mean of their compeers in the Foothills was 118--a

TABLE 3.11--Comparisons, according to several indexes of academic achievement, between white high-sixth-grade boys in Hills and Foothills, whose parents have some college or more, and whose fathers are professionals or executives: Berkeley, 1959

| Achievement variable | Percentage or mean<br>Hills | <br>Foothills |
|---|---|---|
| "Outstanding" (A or B) in reading | 72%<br>(76) | 64%<br>(11) |
| Reading at grade level | 97<br>(76) | 64<br>(11) |
| "Outstanding" (A or B) in arithmetic | 63<br>(76) | 45<br>(11) |
| Mental Maturity Test scores | 130<br>(63) | 116<br>(8) |
| Reading Achievement Test scores | 108<br>(75) | 106<br>(10) |
| Arithmetic Achievement Test scores | 86<br>(74) | 70<br>(10) |

difference in means of 9 points; when one eliminates the non-whites, and those having parents who have not been to college, the contrast between the remaining, more homogeneous, groups is 130 to 116--a difference in means of 14 points.

This argument, resting on the comparison of "like" groups may not be intuitively compelling as proof of the influence of the school milieux. It has been shown, however, the reader will recall, that teachers expectations are modified by the norm of the school; and, later, in chapter five, it will be shown more directly that differences between school milieux have a clear effect in supporting or contravening the influence of the family. These cross-cutting reference groups affect achievement indirectly, of course, by enveloping the boys in communities of contrasting genius. In the next chapter we will consider the aspirational ethoses in the respective school strata.

## IV. ASPIRATIONS BY SCHOOL STRATA

More consonant evidence has been accumulated demonstrating the differences between high-school students of various social strata in occupational and college-going aspirations, and eventual collegiate admissions, than in any other topic in educational sociology. Tracing educational aspirations and occupational preferences back to the elementary school might seem to be taking unrealistic fantasy too seriously. But it is precisely their fantasy and aspirations which are indicative of their values and expectations. We are not directly concerned here with the predictive validity of their aspirations, but those students who hope to go to college and to attain high-status occupations are all too aware of the relevance of present achievement to their futures. The gist of follow-up interviews with many of these students on this topic made this utilitarian rationale for industry in school abundantly apparent.

The question from which educational aspirations were inferred was posed, along with others of the same pattern,[1] as a forced choice between a set of paired comparisons:

K. When I have finished high school I'd rather
61. ___go directly to a four-year college or university.
___get a job right away.
___much ___somewhat ___slightly
62. ___get a job right away.
___go to a trade school.
___much ___somewhat ___slightly
63. ___go to a trade school.
___go directly to a four-year college or university.
___much ___somewhat ___slightly

---

[1] See Appendix B.

64. __go to a junior college.
__go directly to a four-year college
or university.
__much __somewhat __slightly

65. __get a job right away.
__go to a junior college.
__much __somewhat __slightly

66. __go to a trade school.
__go to a junior college.
__much __somewhat __slightly

This format offers the opportunity to check upon the internal consistency of the responses. If the student maintains a rank order of preference between the four alternatives consistently while making his choices, he will select one alternative (his first choice) three times, over all the others; another twice, over the remaining two; and a third once, over the least liked alternative. Any other pattern than "3-2-1-0" will involve one or two "circular triads" (e.g., preferring college to trade school, trade school to job, but job to college).[1] The proportion of circular triads which would arise by chance--that is, making each choice without regard for an over-all pattern of preference,--the "expected frequencies" of circular triads which would result from 405 respondents flipping coins, for example, to choose, and the actually observed frequencies of the various response patterns are tabulated in Table 4.1. (The strength responses have been ignored for this analysis.) It is apparent that the great majority, ninety per cent, responded consistently. The likelihood of obtaining this proportion, were the students responding in a "hit or miss" fashion, is infinitesimal.

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[1] Maurice G. Kendall, The Advanced Theory of Statistics (London: Charles Griffin & Company Limited, 1943), I, 421-28.

TABLE 4.1--Probability, expected frequencies, and observed frequencies of circular triads among paired comparisons between post-high-school alternatives; and contributions to the value of chi squared: high-sixth-grade boys, Berkeley, 1959

| No. of triads | Probability | Expected frequency | Observed frequency | $\frac{(F_e - F_o)^2}{F_e}$ |
|---|---|---|---|---|
| 0 | 0.375 | 151.875 | 366 | 301.9 |
| 1 | 0.250 | 101.250 | 27 | 54.4 |
| 2 | 0.375 | 151.875 | 12 | 129.8 |
| Total | 1.000 | 405.000 | 405 | 486.1 |

The responses were dichotomized into those aspiring to go to college versus those preferring other alternatives. Those who chose junior college first, provided a four-year college or university was their second choice, were included among the college aspirants, since many students enter junior college first and transfer later to a four-year college. This would be a logical response pattern for students with these intentions.

Occupational aspirations were obtained from a free response question which was subsequently coded into the same categories as the occupations of the fathers:

81. The job or occupation I would like to have when I
am all through with school is

________________________________________

There is an association, as one would expect, between these two facets of aspirational levels. Eighty-seven per cent of the students aspiring to professional or executive positions also aspired to go to college, whereas forty-six per cent of those indicating blue-collar preferences wanted to go to college. One might suppose that the deviant cases will provide much of the depreciation from aspirations to eventual realization. Those who do not now want to go to college, unless they mend their ways, are unlikely to attain high status occupations. Nor are those who are interested in manual trades likely to sustain the effort required to extend their education. One boy who wanted to be a fisherman, working in the coastal waters from his own boat, wanted to go to college "in case I can't do what I want." He wasn't burning any bridges behind him. But his grades were poor, he liked the out-of-doors, and did not enjoy schoolwork. Persevering in distasteful activity, when pleasurable rewards, which are more highly valued, are closer at hand--more attainable,--seems unlikely.

As was true of academic achievement, aspirations are partially contingent upon familial influence. In Table 4.2 the occupational and educational aspirations of students are tabulated according to the occupational level of their fathers. Many more students aspire to go to college, than aspire to occupations ordinarily requiring a college education, especially among boys from lower socioeconomic strata. Equality of opportunity is more a gospel and fact in the realm of education than in the market-place, especially for ethnic minorities.

TABLE 4.2--Percentages of high-sixth-grade boys aspiring to professional or executive occupations, and aspiring to go to college, according to fathers' occupations: Berkeley, 1959

| Father's occupation | Percentages aspiring to: Professional or executive occupations | Percentages aspiring to: Go to college |
|---|---|---|
| Executive | 81%<br>(21) | 92%<br>(26) |
| Professional | 66<br>(77) | 83<br>(93) |
| Merchant: self-employed | 50<br>(26) | 80<br>(30) |
| Upper white collar | 60<br>(25) | 81<br>(37) |
| Lower white collar | 36<br>(22) | 71<br>(31) |
| Artisan: self-employed | 58<br>(12) | 72<br>(18) |
| Skilled manual | 43<br>(37) | 71<br>(48) |
| Semi- and unskilled manual | 27<br>(55) | 65<br>(75) |
| All occupations | 51%<br>(311) | 77%<br>(405) |

Tabulating occupational aspirations by school strata, in Table 4.3, again we see the depression of aspirations toward the mode of the school. Contrasting the Negro students with the white students in the school strata, however, there is an interesting reversal. More Negroes in the Flats, where they are a majority, have high aspirations, than in the Foothills, where they are a minority. This same reversal holds true in the case of educational aspirations. These tallies are shown in Table 4.4.

TABLE 4.3--Percentages of high-sixth-grade boys aspiring to professional or executive occupations by fathers' occupations and school strata: Berkeley, 1959

| Father's occupation | School stratum<br>Hills | <br>Foothills | <br>Flats |
|---|---|---|---|
| Professional & executive | 70%<br>(79) | 65%<br>(17) | ---<br>(2) |
| White collar & merchant | 53<br>(38) | 53<br>(15) | 40%<br>(20) |
| Manual & artisan | ---<br>(2) | 43<br>(46) | 29<br>(56) |
| All occupations | 65%<br>(124) | 49%<br>(86) | 37%<br>(101) |

TABLE 4.4--Occupational and educational aspirations by race and school strata: high-sixth-grade boys, Berkeley, 1959

| | Percentages aspiring to professional or executive occupations | | | Percentages aspiring to go to college | | |
|---|---|---|---|---|---|---|
| Race | Hills | Foothills | Flats | Hills | Foothills | Flats |
| Negro | ---<br>(2) | 27%<br>(11) | 35%<br>(63) | ---<br>(2) | 55%<br>(20) | 72%<br>(81) |
| White | 65%<br>(117) | 51<br>(59) | 29<br>(24) | 89%<br>(143) | 71<br>(85) | 62<br>(29) |
| All races | 65%<br>(124) | 49%<br>(86) | 37%<br>(101) | 88%<br>(150) | 69%<br>(126) | 71%<br>(129) |

The population in the Hills is homogeneously white, and all factors are conducive to high levels of aspiration. Looking at the two four-fold sub-tables, composed by Negroes and whites in the Foothills and Flats, though, the interaction is far more pronounced than the main effects. The Negroes segregated in the Flats have high occupational aspirations, and exceedingly high educational hopes--almost three-fourths of them wanting to go to college. This finding first suggests the interpretation that minority status is a heteregeneous group has a demoralizing and depressing effect upon aspirational levels. But, focussing attention upon the high aspirations of the Negroes in the Flats as a deviation from an otherwise regular pattern, a more plausible construction is that a segregated social minority can generate and maintain higher hopes than when integrated. It can develop its indigeneous leadership, and is not demoralized by continuous tokens of their imposed inferiority.

The plight of these hopes, though, is indicated by reference to the indexes of achievement, which are standardized across groups in Table 4.5.

TABLE 4.5--Academic achievement by race and school strata: high-sixth-grade boys, Berkeley, 1959

| Race | School stratum<br>Hills | <br>Foothills | <br>Flats |
|---|---|---|---|
| **A. Mean California Mental Maturity Test scores** | | | |
| Negro | ---<br>(1) | 107<br>(18) | 97<br>(58) |
| White | 126<br>(124) | 113<br>(69) | 107<br>(20) |
| **B. Mean California Reading Achievement Test scores** | | | |
| Negro | ---<br>(2) | 76<br>(19) | 68<br>(73) |
| White | 106<br>(141) | 96<br>(82) | 84<br>(26) |
| **C. Mean California Arithmetic Achievement Test scores** | | | |
| Negro | ---<br>(2) | 57<br>(19) | 51<br>(70) |
| White | 83<br>(139) | 69<br>(77) | 55<br>(27) |

The normalization of achievement on the part of the teacher, which was discussed in chapter three, may play a contributory role in sustaining these unrealistic aspirations. While only two of the twenty Negro students in the Foothills were mentioned by their teachers as outstanding readers, fourteen out of eighty-one were so mentioned in the Flats. Perhaps more telling, though, than the norm itself, is the greater discrepancy between racial groups in the foothills--forestalling unwarranted optimism on the part of the Negroes. The percentages marked as outstanding readers were:

| | Foothills | Flats |
|---|---|---|
| Negro | 10% | 17% |
| White | 52% | 24% |

Leaving aside this interaction between minority status and aspirations within the heterogeneous schools, let us return to the contrast between the Hills schools and those of the Foothills and Flats with respect to college aspirations. The detailed differences between these two strata are tabulated below in Table 4.6.

TABLE 4.6--Percentages aspiring to go to college by fathers' occupations and school strata: high-sixth-grade boys, Berkeley, 1959[a]

| | Hills | | Foothills & Flats | |
|---|---|---|---|---|
| Father's occupation | N | Per cent | N | Per cent |
| Executive | 21 | 100.0% | 5 | 60.0% |
| Professional | 74 | 83.8 | 19 | 78.9 |
| Merchant | 22 | 90.9 | 8 | 50.0 |
| Upper white collar | 23 | 87.0 | 14 | 71.4 |
| Lower white collar | 2 | 50.0 | 29 | 72.4 |
| Artisan | 1 | 100.0 | 17 | 70.6 |
| Skilled manual | 2 | 100.0 | 46 | 69.6 |
| Semi- and unskilled | 0 | ---- | 75 | 65.3 |
| Not available | 5 | 100.0 | 42 | 76.2 |
| Total | 150 | 88.0% | 255 | 69.8% |

[a] Percentages are reported in detail, even where obviously unreliable, to form the basis for the subsequent analysis.

The number of cases upon which these percentages are based are so varied, and some so small, that the reader may be in some doubt as to the reliability of the differences. If each proportion is construed as a random sample estimate of a population proportion--the hypothetical population of high-sixth-grade boys in Berkeley accumulated through the years, assuming there are no historical trends (i.e., "everything else being equal")--an analysis of the sources of variation, though involved, may be performed.[1] The probabilities of obtaining these differences between school strata, and between occupational groups, considering the "sampling" variability of each percentage, is reported in Table 4.7.

TABLE 4.7--Analysis of variance of percentages aspiring to go to college, by school strata and fathers' occupations: high-sixth-grade boys, Berkeley, 1959

| Source of variation | Sum of squares | df | Mean square | Probability |
|---|---|---|---|---|
| School strata | 9.2956 | 1 | 9.2956 | .01- |
| Fathers' occupations | 7.9593 | 7[a] | 1.1370 | .10+ |
| Interaction | 9.4882 | 6[b] | 1.5814 | .10+ |
| Error | | $\infty$ | 1 | |

[a] The "Not available" category, not providing a controlled comparison, is not included in the analysis.

[b] The number of degrees of freedom for interaction is reduced by one because of the cell with no entry: semi- and unskilled manual workers in the Hills. See reference in n. 1, below.

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[1] This entails the arcsin transformation of each proportion to angles (so that the variance of each estimate is a simple function of the number of cases), and the differential weighting of these angular differences to correct for the non-orthogonality of the comparisons. The routine is described by George W. Snedecor, Statistical Methods, Applied to Experiments in Agriculture and Biology (5th ed.; Ames, Iowa: Iowa State College Press, 1956), pp. 338, 382-85. See especially example 12.15.2.

On the basis of this analysis we can have considerable confidence in the difference between school strata (a difference so large that it would arise fewer than one time in a hundred by chance "sampling" from a "population" in which there was, in fact, no difference). But the effect of occupational stratification upon the educational aspirations of high-sixth-grade boys within school strata in Berkeley is insignificant.

In order to make a more direct assessment of the influence of the parents upon educational aspirations, two additional items of information were collected in the survey. The fathers of the boys were sent a mail questionnaire in which the following question, adapted from a National Opinion Research Center survey,[1] was asked:

> 2. About how much schooling do you think most young men need these days to get along well in the world?
> ___some high school
> ___graduate from high school
> ___some college or junior college
> ___graduate from a four-year college

The students were asked, in their questionnaire, to tell what they thought their parents' responses might be to the same question. The joint frequencies of the parents' and students' responses are tallied below, in Table 4.8.

It can be seen from this distribution that there is only a very slight relationship between the parents' responses and the children's responses. Looking at the joint effect of these two indexes upon the college aspirations of the students, in Table 4.9, we see, however, that each of these independent indexes has a powerful effect. The student's perception, as one might expect, has the greatest bearing upon his aspiration. Contrasting the marginals, we see, for example, that where the parents say a

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[1] Summarized in Opinion News (September 1, 1947). Cited by Hyman, op. cit. See Appendix B.

TABLE 4.8--Joint frequency distribution of parents' recommendations for schooling, and students' perceptions of their parents' recommendations: high-sixth-grade boys, Berkeley, 1959

| Student's perception | Parent's recommendation[a] | | | | | |
|---|---|---|---|---|---|---|
| | 1[b] | 2 | 3 | 4 | 5 | Total |
| 1. Graduate from college | 218 | 66 | 9 | 1 | 53 | 347 |
| 2. Some college or J. C. | 20 | 9 | 4 | 0 | 2 | 35 |
| 3. Graduate from high school | 5 | 8 | 1 | 0 | 1 | 15 |
| 4. Some high school | 1 | 1 | 0 | 0 | 0 | 2 |
| 5. No response | 3 | 1 | 0 | 0 | 0 | 6 |
| Total | 247 | 85 | 14 | 1 | 58 | 405 |

[a] The parents' recommendations are numbered to correspond to the students' perceptions, labelled in the left margin.

[b] Qualified responses, such as, "As far as their ability will take them," are included in this category. Such qualifications--which the banal question calls for--were made most frequently by fathers who were college graduates themselves.

TABLE 4.9--Percentages aspiring to go to college by parents' recommendations for schooling and students' perceptions of their parents' recommendations: high-sixth-grade boys, Berkeley, 1959

| Student's perception | Parent's recommendation | | | |
|---|---|---|---|---|
| | College | Some college | High school | Total |
| College | 85%<br>(218) | 74%<br>(66) | 67%<br>(9) | 82%<br>(347) |
| Some college | 60<br>(20) | 56<br>(9) | --<br>(4) | 51<br>(35) |
| High school | --<br>(5) | 25<br>(8) | --<br>(1) | 20<br>(15) |
| Total | 80%<br>(247) | 68%<br>(85) | 43%<br>(14) | 77%<br>(405) |

high-school education would suffice, 43% of their sons nevertheless want to go to college; but if their sons think the parents think high school would suffice, only 20% want to go to college. (This, in part, is due to the poor question: some parents don't think "most young men" need college, yet may want their sons to go. The children, on the other hand, perceive their parents' attitudes in personal terms.)

Inasmuch as the parents' occupations were not found to have a clear-cut import for educational aspirations, and their logical role in this analysis has been as an indication of the impact of the parent's values upon their children--an impact much more directly indicated by the students' perceptions of their parents' recommendations for schooling--let us determine whether school differences affect aspirations when this index of familial influence is held constant. This analysis appears in Table 4.10. (The parents' own responses, if taken as an index in spite of their dubious validity, yield comparable results, except that the influence of the parents, again, appears minimized.)

TABLE 4.10--Analysis of educational aspirations by school strata and students' perceptions of parents' recommendations for schooling: high-sixth-grade boys, Berkeley, 1959

A. Percentages aspiring to go to college

| Student's perception of parent's recommendation | Hills |  | Foothills & Flats |  |
|---|---|---|---|---|
|  | N | Per cent | N | Per cent |
| College | 140 | 90.0% | 207 | 76.8% |
| Some college | 10 | 60.0 | 25 | 48.0 |
| High school | 0 | ---- | 15 | 20.0 |
| Some high school | 0 | ---- | 2 | 50.0 |
| No response[a] | 0 | ---- | 6 | 50.0 |
| Total | 150 | 88.0% | 255 | 69.8% |

B. Analysis of variance

| Source of variation | Sum of squares | df | Mean square | Probability |
|---|---|---|---|---|
| School strata | 11.2413 | 1 | 11.2413 | .01- |
| Perception | 31.8116 | 3 | 10.6039 | .01- |
| Interaction | 0.0950 | 1 | 0.0950 | .10+ |
| Error |  | ∞ | 1 |  |

[a] This row, again, is not used in the analysis of variance. It is presented only to account for the entire sample.

Both parents and the school situation clearly and significantly influence the proportion of students aspiring to go to college. There is no interaction: the parents' influence is the same in both strata, and the school's influence is similar whether or not the students believe their parents would recommend college.

If we use the logic of the last chapter to assess this effect of the school milieu upon educational aspirations--that is, the progressive multivariate "homogenization" of comparison groups--we find that among the Caucasian sons of professionals and executives, both parents having some college or more, ninety-one per cent in the Hills want to go to college, whereas only sixty-four per cent of their compeers in the Foothills wish to do so. Considering the sons of all professionals and executives, of all racial and educational backgrounds, the same comparison is eighty-seven per cent to seventy-three per cent. So again we find that the refinement of controls sharpens, rather than reduces, the effect.

Variation in teachers' expectations, and the obvious practical need to universalize the curriculum--to deal with the class as a group--contribute to the strata differences in achievement, and may also affect the students' aspirations. Yet the values and interests of the students' peers further serve as a positive reference.[1] The ubiquitous quest for popularity and respect among one's associates leads to a homogenization of values. The elementary school boy, though, has little choice of associates; he is, rather, the captive of his fellows. Interests arising from a parochial view are ascribed, not achieved; constrained rather than liberal. The mechanical solidarity of the social group--the solidarity based on likeness and depending on sanction--is a mold narrowing individual horizons. In the next chapter, the social structure, cohesion, and channels of communication in school classes, will be examined more closely.

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[1] Some further indication of the differences in habits and tastes of the students at the different schools, beyond those suggested by the contrasts in achievement and aspiration, and those which may be inferred from the widely differing economic compositions of the neighborhoods, come from the question asked about students' spare-time activities (see Appendix B). Very few boys at this age prefer reading and homework to sports, playing with friends, TV, etc., yet proportionately more do in the higher strata than in the lower. Only six per cent of the boys in the Foothills and Flats indicated reading or homework as a favorite activity, as contrasted with eighteen per cent in the Hills. While not preferring reading to other activities, two-thirds of the boys in the Hills say they do read, whereas only a half of the boys in the two lower strata say they read.

# V. INTRAGENERATIONAL TRANSMISSION OF VALUES

At several points in the discussion thus far it has been intimated that students are influenced by their perception of the values, interests, and actions prevalent among their peers; and that this influence contributes to the homogenization of behavior within strata and the differences between strata.

There is a considerable body of evidence accumulated in the experimental researches by social psychologists which makes this supposition plausible. Several decades ago Moore[1] demonstrated the effects of majority opinion upon grammatical, ethical, and musical judgments. Later Sherif,[2] in a series of experiments, showed the influence of others upon an individual's estimates of the distances of autokinetically induced movements of a point of light. Duncker[3] found that the selections of friends and older children had a pronounced effect upon the food choices of nursery school children; and Berenda,[1] using the well-known experimental situation developed by Asch,[2] showed that eighty per cent of the children from ages ten to thirteen make incorrect comparisons between the lengths of lines when confronted by classmates who unanimously (deliveragely) make "errors"; even though all of the subjects could make correct judgments when by themselves.

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[1] Henry T. Moore, "The Comparative Influence of Majority and Expert Opinion," The American Journal of Psychology, XXXII (January, 1921), 16-20.

[2] Muzafer Sherif, "Group Influences upon the Formation of Norms and Attitudes," Readings in Social Psychology, ed. Eleanor E. Maccoby, Theodore M. Newcomb, and Eugene L. Hartley (3d ed.; New York: Henry Holt and Company, 1958), pp. 219-32, based on his earlier work, "A Study of Some Social Factors in Perception," Archives of Psychology, No. 187 (July, 1935). See, also, Sherif, The Psychology of Social Norms (New York: Harper & Brothers, 1936).

[3] K. Duncker, "Experimental Modification of Children's Food Preferences through Social Suggestion," Journal of Abnormal and Social Psychology, XXXIII (October, 1938), 489-507.

Lewin and his associates[3] have shown that people's task aspirations and goal-setting behavior are influenced by their information about the achievement of others. Chapman and Volkmann,[4] while confirming Lewin's findings, noted that the suggestion of others' norms was not effective when the individual has his own past performance available as a frame of reference.

In these contrived situations, however, the impact, or at least the perception, of others is artificially enforced. Ordinarily considerable self-selection is involved in the influences to which we expose ourselves.[5]

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[1] Ruth W. Berenda, The Influence of the Group on the Judgements of Children: an Experimental Investigation (New York: King's Crown Press, 1950).

[2] Solomon E. Asch, Social Psychology (New York: Prentice-Hall, Inc., 1952), pp. 450-501.

[3] Kurt Lewin, et al., "Level of Aspiration," Personality and the Behavior Disorders: a Handbook Based on Experimental and Clinical Research, ed. J. McV. Hunt (New York: The Ronald Press Company, 1944), I, 333-78.

[4] Dwight W. Chapman and John Volkmann, "A Social Determinant of the Level of Aspiration," Readings in Social Psychology, op. cit., pp. 281-90.

[5] Evidence that people select political information according to their predispositions is presented by Paul F. Lazarsfeld, Bernard Berelson, and Hazel Gaudet, The People's Choice: How the Voter Makes up his Mind in a Presidential Campaign (New York: Columbia University Press, 1944), pp. 79-82. See, also, Herbert H. Hyman and Paul B. Sheatsley, "Some Reasons Why Information Campaigns Fail," Public Opinion Quarterly, XI (Fall, 1947), 412-23.

Hollinghsead,[1] in his study of the impact of social classes on adolescents, has emphasized that the associations and cliques among high-school students fall predominantly within social strata rather than crossing the lines of community stratification. This raises the question as to whether the structure of associations within elementary school classes serves to insulate students with divergent aspirations from one another, or whether channels of communication exist across social strata permitting the diffusion of group norms.

The thesis which we have suggested would be somewhat more tenable if it were shown that there were social contacts running across stratification lines within school classes: if, for example, the sons of professionals and executives in the Foothills and Flats in fact associate with students who do not aspire to go to college. The pressure of group opinions would be more compellingly apparent were it found that non-college goers were relatively better integrated in the social structures of the lower strata schools, and more isolated in the upper. Social acceptance--the threat of ostracization--exerts a powerful leverage toward conformity. But are educational aspirations and attitudes relevant to students' evaluations of one another? Or, turned about, does the degree of social integration in the peer-group structure affect the mobility aspirations, in the wider community of adults, of elementary school boys?

In order to investigate the social contracts of the students with their peers, a simple sociometric inventory was administered. Each student was given a mimeographed list of the names of his classmates. He was asked to check the names of his friends--those with whom he talked and played during recesses, lunch periods, or after school. (As one boy succinctly put it: "You mean the kids we mess around with.")

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[1] August B. Hollingshead, Elmtown's Youth: the Impact of Social Classes on Adolescents (New York: John Wiley & Sons, Inc., 1949), especially pp. 208-17. Cf., also, W. Lloyd Warner, Democracy in Jonesville: a Study in Quality and Inequality (New York: Harper & Brothers, 1949), pp. 77-88.

Taking the percentage of classmates (boys and girls) choosing each boy as a crude indication of his popularity, and averaging these percentages over sub-groups, in Table 5.1, reveals systematic differences between school strata. We find the interaction we were anticipating: the non-college aspirants are less popular in the Hills than the college aspirants, while college aspirations are not particularly relevant to popularity in the Foothills and Flats. The most pronounced variation revealed by this table, however, is the "main effect": the differences between school strata in the average popularity of the students. Not only is the non-college aspirant underchosen in the Hills, but there are fewer contacts,

TABLE 5.1.--Mean popularity (percentage of classmates choosing each individual), according to school strata and educational aspirations: high-sixth-grade boys, Berkeley, 1959

| | School stratum | | |
|---|---|---|---|
| Educational aspirations | Hills | Foothills | Flats |
| College | 35%<br>(132) | 42%<br>(87) | 48%<br>(91) |
| Non-college | 25<br>(18) | 39<br>(39) | 46<br>(38) |
| All aspirations | 34%<br>(150) | 41%<br>(126) | 47%<br>(129) |
| Difference in popularity between college and non-college aspirants | 10% | 3% | 2% |

less interplay, between students in the Hills, whether or not they aspire to go to college, than among students in the lower strata.

Looking at the reciprocated choices among the boys, alone, to see whether the sons of professionals and executives in the Foothills and Flats have contacts with non-college aspirants, we find only two (out of twenty-four) who do not, and these two are among those who themselves want to go to college. Tallying the median number of reciprocated choices of the boys in this occupational group with peers who want, and don't want, to go to college, in Table 5.2, we observe the following relationships:

1. The boys in the Foothills and Flats have more contacts with non-college aspirants than do the boys in the Hills.
2. In all strata there is a tendency for boys to associate with peers of like aspirations.

TABLE 5.2.--Median number of mutual (reciprocated) choices with college and non-college aspirants by sons of professionals and executives, according to school strata and educational aspirations: high-sixth-grade boys, Berkeley, 1959

| Aspirations of contacts | Hills |  | Foothills & Flats |  |
|---|---|---|---|---|
|  | College | Non-college | College | Non-college |
| College | 4 | 3.5[a] | 4 | 4 |
| Non-college | 0 | 1 | 2 | 3 |
| Number of cases | 83 | 12 | 18 | 6 |

[a] No one, of course, had three and a half reciprocated choices. Six of these twelve boys had four or more contacts who wanted to go to college, and six had three or fewer.

3. The non-college aspirants have more contacts with their fellows than the college aspirants in all strata (a change from the results of the previous table resulting from the omission of the preferences of the girls).

4. The boys in the Foothills and Flats have more associates than do the boys in the Hills, on the average (confirming the main effect of the previous table among the boys, alone).

This last finding suggests that the school classes of the lower strata are more socially integrated--cohesive--than are the Hills schools. This notion is congruent with the fact that middle-class parents supervise their children more closely than do working-class parents.[1] The children in the Flats are freer to shift for themselves after school--their time is not consumed by private lessons, and their parents pay less heed to how they spend it or with whom they associate. Taba[1] found that a middle-class academically oriented school had a diffuse, fragmented informal structure as contrasted with a heterogeneous school. In a parallel vein, Ruth Cunningham[2] has pointed out that an "authoritarian" teacher-pupil relationship interferes with the development of sociometric structure in the group. The strength of intergenerational discipline varies inversely with intragenerational cohesiveness.

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[1] While there have been conflicting findings on social-class differences in parental rigidity and restrictiveness, especially in the areas of feeding, toilet training, sex play, and the like (see Urie Bronfenbrenner, "Socialization and Social Class through Time and Space," Readings in Social Psychology, op. cit., pp. 400-25), several studies concur that middle-class mothers charge their youngsters with more responsibilities and have higher expectations. It is not these differences, however, which are most pertinent here. In their leisure time lower-class children participate in unsupervised activities while middle-class children participate more in supervised and selective organized activities. See Hollingshead, op. cit., pp. 288-325; Bossard, op. cit., pp. 340-42; Martin Wolins, Welfare Problems and Services in Berkeley, California: Report of the Community Welfare Study (Berkeley: Berkeley Council of Social Welfare and School of Social Welfare, University of California, November, 1954), p. 75; Davis McEntire, Leisure Activities of Youth in Berkeley, California (Berkeley: Berkeley Council of Social Welfare and School of Social Welfare, University of California, December, 1952).

Neither totalling the number of "votes" cast, nor eliminating unreciprocated choices, as we have done, provides an adequate measure of group cohesion, however. By ignoring the structure of the group, the equal importance of each contact is assumed. An individual may be integrated in a group even though mentioned by only a few persons, if those persons, in turn, are associated with many others. On the other hand, a person may achieve "popularity" through nomination by isolates. Similarly the group as a whole may be well-integrated or fragmented, while having the same total number of contacts internally, depending upon the pattern of associations.

While a considerable amount of effort has gone into the development of procedures for the analysis of sociometric data, thus far no unambiguous scheme has been developed for assessing the integration of individuals within a group, and within sub-group structures, or the cohesion or fragmentation of the group as a whole. A procedure developed by the junior author, Alan B. Wilson, to cope with the present problem, while it involves no mathematical innovations, is a new synthesis and application of routines to the sociometric problem. The details of the procedure are presented here, both to enable the reader to assess the import of the categories which are developed, and because the routine has a general applicability to the analysis of small-group structure, and seems promising as a methodology for future research.

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[1] Hilda Taba, School Culture: Studies of Participation and Leadership (Washington, D.C.: American Council on Education, 1955).

[2] Ruth Cunningham and associates, Understanding Group Behavior of Boys and Girls (New York: Bureau of Publications, Teachers College, Columbia University, 1951).

Following the precedent of Forsyth and Katz,[1] we start with the square sociomatrix, say A, where $a_{ij}$ is the choice (0 or 1, rather than + or -) from _i_ to _j_. Each individual is "entered" into the matrix by inserting 1's in the leading diagonal (self-choices, in effect). This is necessary, as will be clearer from inspection of Table 5.4, below, in order to count the mutual choice between two individuals along with their joint choices of other individuals.

At this point three alternatives are open, depending upon the purpose of the investigation and the interpretation to be made of the results. The matrix of unilateral choices, A, may be post-multiplied by its transpose yielding the matrix, AA', in which each element represents the number of persons whom the individuals heading the row and column respectively jointly choose; or A may be pre-multiplied by its transpose, yielding A'A, in which case $a_{ij}$ would represent the number of persons choosing both _i_ and _j_; or, alternatively, the symmetrical sub-matrix of mutual choices, say $A_s$, may be selected, in which case $A_s^2 = A_sA_s' = A_s'A_s$. The first alternative leads to an analysis of the extent to which individuals choose into the group as a whole and/or into its various factions or cliques; the second to an analysis of the extent to which individuals are chosen by the group as a whole (their popularity), and by its factions; and the third to an analysis of the associations and intercommunicative structure of the group--the "integration" of the individual with the group as a whole and with its cliques. Duncan MacRae[1] has recently suggested the theoretical interest in the simultaneous analysis of the first two alternatives with a view toward contrasting the individual's position as chooser and as chosen. The routine suggested here would be applicable to matrices built up in any of the foregoing ways. However, since the present concern, and the question asked of the subjects, dealt with actual association rather than "liking" or admiration alone, the third alternative is both more appropriate and simpler--leading to a single analysis for each group.

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[1] Elaine Forsyth and Leo Katz, "A Matrix Approach to the Analysis of Sociometric Data: Preliminary Report," _Sociemetry_, IX (November, 1946), 340-47.

The smallest of the Hills classes is used to illustrate the routine. The symmetrical sub-matrix of mutual choices among boys, selected from the original matrix of unilateral choices among boys and girls, is presented in Table 5.3. The upper and left margins contain the identification numbers of the boys; the right and lower marginals, the number of mutual choices (including one self-choice) made by each boy.

The matrix is then squared so that the elements of the squared matrix contain the product-sums, or "covariance," of the mutual choices jointly made by two individuals. The composition of each cell of the

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[1] Duncan MacRae, Jr., "Sociometric Analysis by Principal Components," (typewritten manuscript, July, 1959). Dr. MacRae proposes the direct analysis of unstandardized joint frequencies.

TABLE 5.3.--Matrix of mutual choices: boys of a Hills class

| No. | 03 | 05 | 06 | 15 | 16 | 17 | 18 | 19 | 21 | 25 | 26 | 28 | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 03 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 9 |
| 05 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 7 |
| 06 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 6 |
| 15 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 |
| 16 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 8 |
| 17 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 8 |
| 18 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 9 |
| 19 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 5 |
| 21 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 5 |
| 25 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 4 |
| 26 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 5 |
| 28 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 6 |
| Sum | 9 | 7 | 6 | 2 | 8 | 8 | 9 | 5 | 5 | 4 | 5 | 6 | 74 |

squared matrix is shown in detail in Table 5.4, where the row vector of individual "03" is juxtaposed with the (transposed) column vector of "06".

The product-sum, 5, which is the covariance of these two persons' mutual choices--i.e., the number of choices which they have made in common--is entered into cell $a_{13}$ (and $a_{31}$) of the squared matrix, $A_s{}^2$. (The necessity for entering self-choices is apparent--otherwise the

TABLE 5.4.--Calculation of the product-sum for a pair of individuals

| | Mutual choices | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Individual | 03 | 05 | 06 | 15 | 16 | 17 | 18 | 19 | 21 | 25 | 26 | 28 | Sum |
| 03 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 9 |
| 06 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 6 |
| Product | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 5 |

mutual choice between "03" and "06" would not be counted as covariance. A squared matrix having 0's in the leading diagonal would count two-step contacts only, omitting direct contacts; with the diagonal 1's, the squaring process double-counts direct contacts.) The squared matrix is shown in Table 5.5.

TABLE 5.5.--Product-sum matrix of joint frequencies

| No. | 03 | 05 | 06 | 15 | 16 | 17 | 18 | 19 | 21 | 25 | 26 | 28 | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 03 | 9 | 6 | 5 | 0 | 7 | 7 | 9 | 4 | 3 | 3 | 5 | 5 | 63 |
| 05 | 6 | 7 | 5 | 1 | 4 | 5 | 6 | 3 | 3 | 1 | 5 | 3 | 49 |
| 06 | 5 | 5 | 6 | 1 | 4 | 4 | 5 | 4 | 3 | 1 | 3 | 3 | 44 |
| 15 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 7 |
| 16 | 7 | 4 | 4 | 0 | 8 | 6 | 7 | 4 | 2 | 4 | 3 | 6 | 55 |
| 17 | 7 | 5 | 4 | 0 | 6 | 8 | 7 | 3 | 1 | 4 | 5 | 6 | 56 |
| 18 | 9 | 6 | 5 | 0 | 7 | 7 | 9 | 4 | 3 | 3 | 5 | 5 | 63 |
| 19 | 4 | 3 | 4 | 1 | 4 | 3 | 4 | 5 | 2 | 1 | 2 | 3 | 36 |
| 21 | 3 | 3 | 3 | 2 | 2 | 1 | 3 | 2 | 5 | 0 | 1 | 0 | 25 |
| 25 | 3 | 1 | 1 | 0 | 4 | 4 | 3 | 1 | 0 | 4 | 1 | 4 | 26 |
| 26 | 5 | 5 | 3 | 0 | 3 | 5 | 5 | 2 | 1 | 1 | 5 | 3 | 38 |
| 28 | 5 | 3 | 3 | 0 | 6 | 6 | 5 | 3 | 0 | 4 | 3 | 6 | 44 |
| Sum | 63 | 49 | 44 | 7 | 55 | 56 | 63 | 36 | 25 | 26 | 38 | 44 | 500 |

Because the sizes of the classes differ, and in order to standardize the variance, the table is now reduced to relative rather than absolute joint frequencies.[1] This is performed by dividing each element (product-sum) by the geometric mean of the total number of contacts of the respective individuals.[2] In the instance of Table 5.4, for example, we have $5/\sqrt{9.6} = .680$. This figure is entered into $a_{13}$ and $a_{31}$ of Table 5.6. (Where two individuals have the same number of contacts, this relative joint frequency is the simple proportion of their choices which are common to both. For example, "19" and "21" each make five choices, two of which are for the same individuals. The relative joint frequency of their mutual choices is $2/\sqrt{5.5} = 2/5 = .400$.) This operation can be performed by multiplying first each row and then each column of the joint frequency matrix by the reciprocal of the square root of its diagonal element, i.e., $1/\sqrt{a_{11}}$.

This matrix of standardized joint frequencies is then analyzed into its orthogonal principal components.[3] The elements of the first principal

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[1] Cf., Cyril Burt, "The Factorial Analysis of Qualitative Data," The British Journal of Psychology: Statistical Section, III (November, 1950), 166-85.

[2] This ratio between the joint frequency and the geometric mean of the respective total frequencies of contacts is, in effect, the coefficient of correlation, assuming zero means. Cf., Carl H. Fischer, "On Correlation Surfaces of Sums with a Certain Number of Random Elements in Common," The Annals of Mathematical Statistics, IV (1933), 103-26; also Snedecor, op. cit., pp. 170-73.

[3] See, e.g., Margaret Jarman Hagood and Daniel O. Price, Statistics for Sociologists (rev. ed.; New York: Henry Holt and Company, 1952), pp. 537-41, for a routine where the work is to be done with a desk calculator. The analysis of the present illustration was first done "by hand" in this way. A "fortran" program was then written for the IBM 704, and the analysis was re-run as a check on both the hand calculations and the program. After the program was "de-bugged," the remaining twenty-five classes were analyzed on the 704 in about an hour.

TABLE 39.--Standardized matrix of joint frequencies

| No. | 03 | 05 | 06 | 15 | 16 | 17 | 18 | 19 | 21 | 25 | 26 | 28 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 03 | 1.000 | .756 | .680 | .000 | .825 | .825 | 1.000 | .596 | .447 | .500 | .745 | .680 |
| 05 | .756 | 1.000 | .772 | .267 | .535 | .668 | .756 | .507 | .507 | .189 | .845 | .463 |
| 06 | .680 | .772 | 1.000 | .289 | .577 | .577 | .680 | .730 | .548 | .204 | .548 | .500 |
| 15 | .000 | .267 | .289 | 1.000 | .000 | .000 | .000 | .316 | .632 | .000 | .000 | .000 |
| 16 | .825 | .535 | .577 | .000 | 1.000 | .750 | .825 | .632 | .316 | .707 | .474 | .866 |
| 17 | .825 | .668 | .577 | .000 | .750 | 1.000 | .825 | .474 | .158 | .707 | .791 | .866 |
| 18 | 1.000 | .756 | .680 | .000 | .825 | .825 | 1.000 | .596 | .447 | .500 | .745 | .680 |
| 19 | .596 | .507 | .730 | .316 | .632 | .474 | .596 | 1.000 | .400 | .224 | .400 | .548 |
| 21 | .447 | .507 | .548 | .632 | .316 | .158 | .447 | .400 | 1.000 | .000 | .200 | .000 |
| 25 | .500 | .189 | .204 | .000 | .707 | .707 | .500 | .224 | .000 | 1.000 | .224 | .816 |
| 26 | .745 | .845 | .548 | .000 | .474 | .791 | .745 | .400 | .200 | .224 | 1.000 | .548 |
| 28 | .680 | .463 | .500 | .000 | .866 | .866 | .680 | .548 | .000 | .816 | .548 | 1.000 |

component are measures of the individual's integration within the group as a whole. These values will all be positive, and will be, very roughly, proportional to the marginal totals of Table 5.5--i.e., the total number of contacts the individual has within the class.[1] (In the case of the A'A alternative analysis, the first component would clearly measure "popularity"; in the AA' alternative it would indicate, perhaps, the individual's "friendliness" or "outgoingness"--or wishful thinking.) The proportion of the total variance associated with this first component is itself a variable of considerable interest for intergroup comparisons. The more fragmented the group structure--the more cleavage--the greater will be the role of subsequent bi-polar components.

As intimated above, the second and subsequent components will be bi-polar--reflecting the lines of cleavage within the group. The first two components of our numerical illustration are juxtaposed beside the original matrix of mutual choices in Table 5.7, below, to facilitate the interpretation.

Grossly, those who have the largest number of contacts, "03" and "18", have the highest "integration" loadings; those who have the fewest, "15", especially, and "25", have the lowest. The discrepancies are also of interest. "19" and "21" each have five mutual contacts (including their self-choices), but have diverging loadings of .706 and .444 respectively. The reason for this is reflected in the marginals

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[1] By Cyril Burt's method of "simple summation" the first factor loadings equal $\sqrt{\Sigma N_i / \Sigma\Sigma N_{ij}}$. These values approximate the loadings of "weighted summation" (i.e., principal component analysis). See Burt, op. cit., and also "A Comparison of Factor Analysis and Analysis of Variance," *The British Journal of Psychology: Statistical Section*, I (October, 1947), 3-26.

TABLE 40.--Matrix of mutual choices, first two components, and associated variances

| Matrix of mutual choices | | | | | | | | | | | | | | Component | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | I | II | Variance accounted for |
| No. | 03 | 05 | 06 | 15 | 16 | 17 | 18 | 19 | 21 | 25 | 26 | 28 | Sum | Integration | First cleavage | |
| 03 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 9 | .940 | -.033 | 90% |
| 05 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 7 | .817 | .318 | 77 |
| 06 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 6 | .787 | .378 | 76 |
| 15 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | .159 | .729 | 58 |
| 16 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 8 | .872 | -.226 | 83 |
| 17 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 8 | .898 | -.295 | 85 |
| 18 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 9 | .940 | -.033 | 90 |
| 19 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 5 | .706 | .275 | 58 |
| 21 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 5 | .444 | .758 | 77 |
| 25 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 4 | .589 | -.537 | 57 |
| 26 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 5 | .772 | -.010 | 54 |
| 28 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 6 | .819 | -.435 | 80 |
| Sum | 9 | 7 | 6 | 2 | 8 | 8 | 9 | 5 | 5 | 4 | 5 | 6 | 74 | | | |
| Variance accounted for . . . . . . . . . . . . . | | | | | | | | | | | | | | 58% | 17% | 75% |

of Table 5.5. "19" has thirty-six direct and two-step contacts, while "21" has but twenty-five. "19" makes mutual contact with both "03" and "18", the most integrated members of the class, while "21's" connections are with less popular members.

As has already been indicated, the first component loadings are roughly proportional to the marginals of Table 5.5. The iterative procedure, however, in maximizing the variance extracted by each successive component, down-grades the loadings of "15" and "21" who are not closely connected with the central nexus of the group; relatively emphasizing, therefore, those whose interconnections are most ramified. The marginals of Table 5.5 and the squared loadings (times 100) are juxtaposed below to facilitate comparison:

| | 03 | 05 | 06 | 15 | 16 | 17 | 18 | 19 | 21 | 25 | 26 | 28 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. of contacts | 63 | 49 | 44 | 7 | 55 | 54 | 63 | 36 | 25 | 25 | 36 | 43 |
| $100 \cdot \text{loading}^2$ | 89 | 68 | 63 | 3 | 77 | 75 | 89 | 51 | 20 | 32 | 54 | 64 |

On the other hand, in the first bi-polar component, as one would anticipate, "21" has the highest loading, along with "15" with whom he is connected, and who is otherwise an isolate. All of the other persons connected with "21"--"05", "06", "19"--have positive loadings, although theirs are lower because they enjoy more integration with the core of the class. "25", on the contrary, has the highest negative loading. He makes no choices in common with "21" (or, of course, with "15"). "17" and "28" also have negative loadings, and their contacts, also, exclude those of "21" ("28" has no joint choices, and "17" but one, with "21").

The second residuals are hardly worth further analyzing. The diagonal elements--self choices--of the less popular individuals, "15", "19", "25", and "26", are the only residuals of note.

Cross-classifying these two components, integration and cleavage, leads to the typology shown in Fig.5.1. In the case of the class which has been used to illustrate the procedure, the individuals fit into the various categories as shown in Table 5.8.[1]

Fig. 5.1.--Typology of locations in sociometric structure obtained by the cross-classification of integration with cleavage

| First component | Second component | | |
|---|---|---|---|
| | Cleavage | | |
| Integration | + | 0 | - |
| High | + Clique | "Stars" | - Clique |
| Low | | "Isolates" | |

TABLE 5.8.--Social locations of individuals in illustrative class

| | Cleavage | | |
|---|---|---|---|
| Integration | + | 0 | - |
| High | 05 06 19 | 03 16 18 26 | 17 25 28 |
| Low | 15 21 | | |

Those individuals who are highly integrated, but are not heavily loaded toward either clique, have balanced contacts with both major sections of the class. They are called "stars" because their associates have connections, in turn, ramifying throughout the group. Those having low loadings on both factors will either be isolated, or, in a larger group, may participate in an isolated minority clique.

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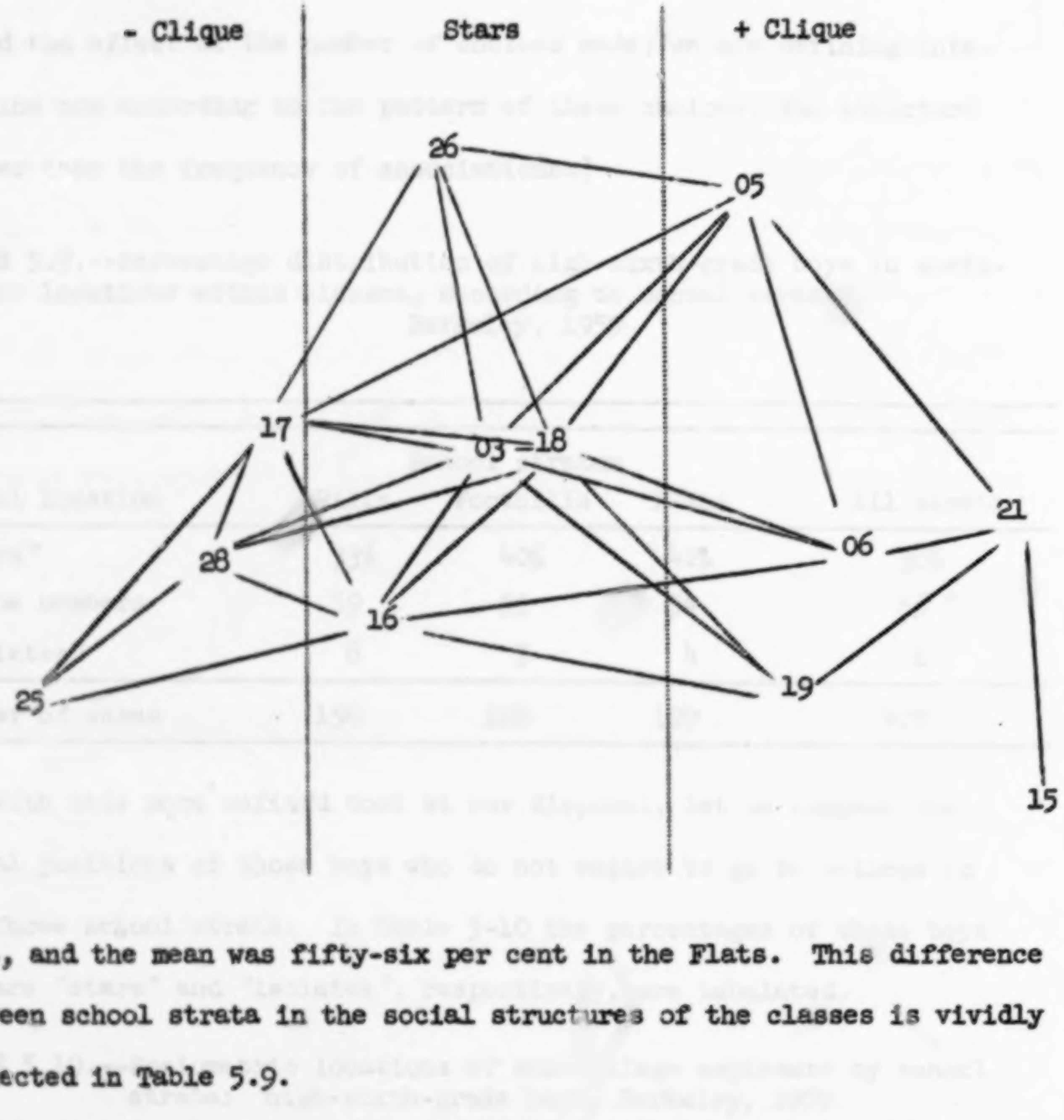
[1] The cutting-points utilized for all twenty-six classes were .490 on the first component, integration, and ±.240 on the second, cleavage.

Those who are assigned to cliques, while some may be as popular as the "stars", achieve their popularity primarily through the choices of their fellow clique members, and are only remotely connected to members of the opposite clique.

To illustrate how this typology fits the original data, a conventional sociogram of the illustrative class has been drawn in Fig. 5.2. (While, with a group as small as this, repeated trial-and-error arrangements--to minimize cross-cutting lines--would result in a similar pattern, the task would be formidable with a larger, and more integrated, group. More important, though, there would be no rigorous way of determining whether "16", say, belonged to the negative clique or should be defined as a "star", so that such decisions would be strictly comparable for different groups. In order to compare the social positions of individuals with like attributes in different groups, an objective definition of boundaries, such as has been proposed here, is necessary.)

Returning to the substance of our discussion, using the analysis which has been described, a regular progression between school strata was found in the proportion of the total variation of choices which could be accounted for by the first principal component--that is, the cohesiveness of the class as a whole, the tendency for everyone to associate with everyone else within the class. The mean proportion in the Hills classes was forty-eight per cent, in the Foothills, fifty-two per

Fig. 5.2.--Sociogram of illustrative class



cent, and the mean was fifty-six per cent in the Flats. This difference between school strata in the social structures of the classes is vividly reflected in Table 5.9.

More students in the Hills are isolates, and, of the remainder, more participate primarily in segmented cliques, than in the Foothills and Flats. In the lower strata the classes are more tightly knit as wholes. More persons are "stars", having interconnections with the entire membership of their classes. On the basis of this analysis we may more confidently affirm the greater social cohesion of the lower stratum classes than we could from the proportion of choices used. (The standardization of the joint frequencies, in Table 5.6, above, eliminated the effect of the number of choices made; we are defining integration now according to the pattern of these choices--the structure rather than the frequency of associations.)

TABLE 5.9.--Percentage distribution of high-sixth-grade boys in sociometric locations within classes, according to school strata: Berkeley, 1959

| | School stratum | | | |
|---|---|---|---|---|
| Social location | Hills | Foothills | Flats | All strata |
| "Stars" | 33% | 40% | 42% | 38% |
| Clique members | 59 | 55 | 54 | 56 |
| "Isolates" | 8 | 5 | 4 | 6 |
| Number of cases | 150 | 126 | 129 | 405 |

With this more refined tool at our disposal, let us compare the social positions of those boys who do not aspire to go to college in the three school strata. In Table 5-10 the percentages of these boys who are "stars" and "isolates", respectively, are tabulated.

TABLE 5 10.--Sociometric locations of non-college aspirants by school strata: high-sixth-grade boys, Berkeley, 1959

| | School stratum | | | |
|---|---|---|---|---|
| Social location | Hills | Foothills | Flats | All strata |
| "Stars" | 39% | 38% | 55% | 45% |
| "Isolates" | 11 | 5 | 0 | 4 |
| Number of cases | 18 | 39 | 38 | 95 |

In the Flats the boys who are disinterested in extending their education are well-integrated in their classes. None of them are isolates, and they are, in fact, far over-represented among the leaders of their peers. In the Foothills, the most heterogeneous schools, college aspirations are irrelevant to social location. Those who do not want to go to college are "stars" and "isolates" in about the same proportion as those who do. In the Hills, more of the non-college aspirants are isolated than in either Foothills or Flats. Relatively, then, terminal students are the social leaders in the lower economic strata. They gain social support from their peers, and, in turn, set the pace for them, without adopting the standards of success prevalent in the wider community of adults.

## VI. ATTITUDES AND ACHIEVEMENT

In the foregoing several chapters we have confirmed, in the case of sixth-grade boys, the ubiquitous impact of socioeconomic stratification upon educational achievement and aspirations; and found further that, as a consequence of residential segregation, these influences are communicated laterally, among peers, so as to create differentiated neighborhood subcultures.

Yet there remains considerable variability within the "homogenized sub-groups" to be accounted for. The factors we have dealt with thus far--e.g., sex, race, residence, socioeconomic background--are ascribed characteristics. Doubtless idiosyncratic physiological differences (which could also be considered "ascribed"), account for some of the residual variation. However, as was mentioned in the introduction, individuals in diverse situations tend to share distinct ideological orientations. Not only are middle-class children typically more future-oriented, but they have a somewhat different vocabulary and evaluation of cultural activities than their working-class compeers.

To the extent that such conative and cognitive differences are correlated with differences in ascribed social locations, they serve to interpret, at a psychological level, the effects of reference groups upon behavior. The fact remains that individual interests and outlooks are not rigidly determined by the immediate milieu in which one is cast. While the pressures of the immediate environment are most proximate, and have their modal effect, individuals in our society are exposed to a plurality of values among which to choose. (It can be considered, in fact, that a central task of the public schools is to expose students to viable alternative values, thereby releasing them from the illiberal constraints of parochialism.)

A central task of this research project has been to develop some instruments to identify salient differences in outlook and interest between students, which were expected to be relevant to their school achievement. It was expected, for example, that students who approached their social environment analytically and reflectively rather than with docile "other direction" would be more successful in academic tasks which, presumably, require deliberation. The scales which were written to differentiate gradations along this dimension (the prudent-immediate scales[1]) proved to be significantly related to achievement. Among the Bay Area high-school students fifty-eight per cent of those who were most "prudent" (deliberative) received A or B median academic grades, while among the most "immediate" ("other directed") only eighteen per cent had comparably high grades.[2]

Inasmuch as we already know that ascribed statuses have a clear-cut impact upon achievement, the question naturally arises, to what extent, if any, do personal preferences and attitudinal stances independently influence achievement? Is, say, "prudence" or "deliberativeness" an orientation bred by middle-class environs which serves to interpret these students' academic success, or does it have an independent effect, explaining some of the variations within classes?

In Table 6.1 the distributions of median academic grades of students in the Bay Area high school study are presented, classified by six

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[1] The content and validity of this and other attitudinal scales are discussed in Appendices A and C.

[2] See Table C-10.

TABLE 6.1--Percentages of high-school students[a] receiving high (A or B) median academic grades, classified by six variables

| Variable<br>Category | Number of Cases | Per Cent |
|---|---|---|
| School strata[b] | | |
| A | 455 | 55% |
| B | 657 | 35 |
| C | 668 | 25 |
| D | 863 | 35 |
| Father's occupation | | |
| Professional & executive | 368 | 58 |
| White collar & merchant | 985 | 38 |
| Manual & artisan | 1290 | 28 |
| Sex | | |
| Boys | 1486 | 30 |
| Girls | 1157 | 43 |
| Educational aspiration | | |
| College | 1398 | 53 |
| Non-college | 1245 | 17 |
| Occupational aspiration | | |
| Professional or executive | 800 | 52 |
| White collar or merchant | 1499 | 33 |
| Manual or artisan | 344 | 12 |
| Prudent-immediate scale | | |
| Prudent-3 | 369 | 59 |
| 2 | 997 | 40 |
| 1 | 976 | 28 |
| Immediate-0 | 301 | 20 |
| Total | 2643 | 36% |

[a] Only the students for whom information was available on all seven of the variables under consideration are included in this table. This reduction was done so that the marginal totals in subsequent tabulations would be consistent; it does not substantially affect the distributions.

[b] The high schools were grouped as follows:
A: Urban--predominantly upper-middle class
B: Urban--heterogeneous (lower-middle class)
C: Urban--working-class
D: Non-urban towns
The first three groups are those dealt with by Wilson in "Residential Segregation of Social Classes. . .," *op. cit.*

variables. The effects of sex, socioeconomic status (here indicated by fathers' occupations), and mobility aspirations have been repeatedly documented in the literature of educational research, and have been consistently evinced in the studies encompassed in the present research project. The independent influence of the school milieu has been argued, in the case of elementary school boys, in the foregoing chapters; and reference has already been made to an article in which the first three of the high school groups were contrasted.

The usual procedure in social survey research, to discover whether a variable has an effect, independent of other variables, is to cross-tabulate the data according to both or all of the variables as we have done in the foregoing chapters. In Table 6.2, for example, the joint effect of fathers' occupations and school differences are shown upon the median academic grades of high-school boys.

TABLE 6.2--Percentages of high-school boys receiving high (A or B) median academic grades by fathers' occupations and school strata

| | School Strata | | | | |
|---|---|---|---|---|---|
| Father's Occupation | A | B | C | D | Total |
| Professional & executive | 62.8%<br>(148) | 56.2%<br>(48) | 30.8%<br>(13) | 54.8%<br>(42) | 58.6%<br>(251) |
| White collar & merchant | 47.1<br>(121) | 29.1<br>(134) | 15.6<br>(109) | 28.3<br>(180) | 30.1<br>(544) |
| Manual & artisan | 45.3<br>(64) | 20.8<br>(159) | 12.9<br>(210) | 17.1<br>(258) | 19.2<br>(691) |
| Total | 53.8%<br>(333) | 29.0%<br>(341) | 14.5%<br>(332) | 24.6%<br>(480) | 29.9%<br>(1486) |

The differences between the categories of the variables shown in the marginal row and column of Table 6.2 (and those in Table 6.1) are confounded with one another--e.g., the high average achievement in the group A schools being in part a consequence of the disproportionate number of sons of professionals and executives enrolled there. The marginal values cannot be taken as estimates of the effect of the classification. When we examine the cross-classified cells within the table we find that there are average differences in achievement between socioeconomic strata in each school stratum, and that boys from similar social backgrounds do not succeed equally well in the different schools.

As we introduce additional variables to "homogenize" our sub-groups, however, we run into the problem which is endemic to this procedure. If we cross-classify by the six variables of Table 6.1 we shall have a 4 x 3 x 2 x 2 x 3 x 4 table containing 576 cells. Since the control variables are all intercorrelated, the cases will be disproportionately distributed among these cells, many cells having vanishing numbers. (In this example 187 of the 576 cells have no cases.)

While cross-classification is rarely carried to such an extreme, the logic of our problem--and of most social problems involving multiple causation--requires some way of assessing the effects of each variable independently of the others. One procedure, which was used earlier, is to consider only those comparisons based upon some minimum number of cases, say ten, in order to judge whether the effect of a variable holds up in a sizeable plurality. Or, since this procedure is wasteful of much of the data, one could consider all of the non-zero cells--counting the number of comparisons which support and those which contradict an hypothesis. These procedures are analogous in logic to the well-known "sign test", although the probability inference may not be overtly specified.

The assumption which is implicit in such procedures is that the sub-group values which are based upon few cases are unreliable, and a few scattered reversals of our expectations are not necessarily indications of any real interactions. What we wish to determine, then, is whether, in general, our "main effects" are different from zero--whether they "hold up."

When we are willing to concede that our data are not sensitive enough to reliably indicate individual interactions--e.g., whether sons of professionals enjoy a greater advantage in the group A than in the group C schools--then we are adopting the mathematical model for sub-group values:

$$Y_{ijk\ldots r} = m + a_i + b_j + c_k + \ldots + l_r + e_{ijk\ldots r},$$

where $\underline{m}$ is the sample mean, $a_i$ is the added effect of being in the $\underline{i}$th category of variable A, ..., and $\underline{e}_{ijk\ldots r}$ an error term. With this model the powerful "method of least squares" becomes available to make efficient estimates of the main effects, utilizing all of the data, but appropriately correcting the estimates for the disproportionate sub-class frequencies. Moreover, using this method, the warrantability of the assumption of negligible interactions may be assessed.

In the example of Table 6.2, the least squares equations are ($a_i$ for father's occupation and $c_i$ for school effects):

$$\begin{aligned}
m&: 1486m + 251a_1 + 544a_2 + 691a_3 + 333c_1 + 341c_2 + 332c_3 + 480c_4 = 444,\\
a_1&: 251m + 251a_1 + 148c_1 + 48c_2 + 13c_3 + 42c_4 = 147,\\
a_2&: 544m + 544a_2 + 121c_1 + 134c_2 + 109c_3 + 180c_4 = 164,\\
a_3&: 691m + 691a_3 + 64c_1 + 159c_2 + 210c_3 + 258c_4 = 133,\\
c_1&: 333m + 148a_1 + 121a_2 + 64a_3 + 333c_1 = 179,\\
c_2&: 341m + 48a_1 + 134a_2 + 159a_3 + 341c_2 = 99,\\
c_3&: 332m + 13a_1 + 109a_2 + 210a_3 + 332c_3 = 48,\\
c_4&: 480m + 42a_1 + 180a_2 + 258a_3 + 480c_4 = 118,
\end{aligned}$$

where the coefficients are the number of cases upon which the percentages in Table 6.2 are based, and the vector of totals (cross-products) in the right-hand column (440, 147, ..., 480) are the numerators of the marginal fractions (e.g., 444/1486 29.9%). The restrictions are:

$$\Sigma\, n_{i.}a_{i.} = 0 = \Sigma\, n_{.j}c_{.j}.$$

Solving this set of simultaneous linear equations for m, the $a_1$'s, and the $c_1$'s, by matrix inversion, we have the results set out in Table 6.3.

TABLE 6.3--Effects of fathers' occupations and of school strata upon median academic grades, estimated by the method of least squares

| Father's occupation | | | School Stratum | | |
|---|---|---|---|---|---|
| $a_1$: | Professional & executive | + 20.3% | $c_1$: | A | + 16.3% |
| $a_2$: | White collar & merchant | + 0.1 | $c_2$: | B | - 0.3 |
| $a_3$: | Manual & artisan | - 7.4 | $c_3$: | C | - 11.5 |
| | | | $c_4$: | D | - 3.1 |
| m: | Mean | 29.9% | | | |

If one wished to test the "significance" of the interactions and main effects, a more rigorous solution would entail the arcsin transformation of the vector of cross-products in order to reduce the variance to a simple function of the number of cases. The effect of this transformation is to give greater weight to extreme percentages which are less variable. When the data do not display extreme percentages based upon substantial numbers of cases, however, the transformation has no substantial effect upon the analysis.

Setting the left side of our simultaneous equations equal to this new vector of constants (in radians) in solving as before, we have the results tabulated in Table 6.4A.[1] If the error terms could be construed as normally distributed--as, say, arising through random sampling (which would be an improper assumption in our case) the analysis of variance and tests of significance outlined in 6.4B would then be appropriate.

TABLE 6.4--Effects of fathers' occupations and of school strata upon median academic grades, estimated by the method of least squares, with intermediate computations performed in radians

A. Estimated Effects (plus the mean)

| Father's occupation | | School stratum | |
|---|---|---|---|
| $a_1$: Professional & executive | 50.6% | $c_1$: A | 46.9% |
| $a_2$: White collar & merchant | 30.5 | $c_2$: B | 30.2 |
| $a_3$: Manual & artisan | 22.6 | $c_3$: C | 18.3 |
| | | $c_4$: D | 27.1 |
| m: Mean | 29.9% | | |

B. Analysis of Variance

| Source of Variation | Sum of Squares | df | Mean Square | P |
|---|---|---|---|---|
| Father's occupation | 55.5 | 2 | 18.5 | .001- |
| School stratum | 52.3 | 3 | 26.2 | .001- |
| Interaction | 6.6 | 6 | 1.1 | .10+ |
| Error | | ∞ | 1 | |

---

[1] The discrepancies between the two analyses, which are insubstantial, may be in part due to rounding errors in converting proportions to radians, and in the computations which were done by the "sweep out" method on a desk calculator in the case of the latter analysis.

As was apparent in the original data, the main effects are highly significant, and the interactions are negligible.

While the test of significance in Table 6.4B is of dubious legitimacy because of the necessary assumption of the normality of errors, if we subtract from each of the observed cell values of Table 6.2 the estimate which we would make for that sub-group on the assumption of no interactions, the residuals will be "error". For example, cell $Y_{11}$ would be 62.8% - (29.9% + 20.3% + 16.3%)= -3.6% (when the computation is carried to additional decimal places). From this table of residuals we may gain some intuitive sense of the warrantability of our assumption, or, if we find that the original assumption appears unwarranted, some additional substantive insight which was not apparent initially. The residuals from the foregoing analysis are laid out in Table 6.5.

TABLE 6.5--Residuals after elimination of the estimated effects of fathers' occupations and school strata

| Father's occupation | School Strata<br>A | <br>B | <br>C | <br>D | Effect<br>+ Mean |
|---|---|---|---|---|---|
| Professional & executive | -3.6% | 6.4% | -7.8% | 7.7% | 50.1% |
| White collar & merchant | 0.9 | -0.6 | -2.8 | 1.5 | 29.9 |
| Manual & artisan | 6.6 | -1.4 | 1.9 | -2.5 | 22.5 |
| Effect + Mean | 46.2% | 29.6% | 18.3% | 26.8% | 29.9% |

The reader will recall that our motivation for undertaking this analysis was to use the available data efficiently for the estimation of main effects when cross-classification had been carried so far that vanishing cell frequencies made the interpretation of interactions implausible. The extension of the direct solution of the least squares normal equations to multi-dimensional tables is a formidable (though not impossible) prospect for a routine research procedure. However, a simple and intuitively appealing interactive procedure, which was suggested by Patterson[1] for the two way layout, can be readily extended. The explanation of the procedure is simpler, however, in the case of a two-dimensional than a multi-dimensional array. The least squares solution presented above can be taken for comparison.

If we take the deviations of the marginal means from the grand mean (e.g., $a_1$: 58.6% - 29.9% = 28.7%) as a first approximation to the effects of the classifications, and subtract these "effects" from the elements of their corresponding rows or columns, because the marginals are confounded, the marginals of the residual matrix, while deviating less than before from each other and from the grand mean, will not be reduced to the grand mean as they would if the comparisons were orthogonal. However, if this process is repeated several times, the deviations of the marginals will grow less and less as the mrrginal values converge on the grand mean, and the sum of the series of adjustments which have been made for each marginal will approximate (depending upon the closeness of convergence) the corresponding $a_i$ and $c_i$ constants calculated by the least squares method. Taking Table 6.2 once again for illustration, the original A deviations are (when rounded) 28.7, 0.3, -10.6. These numbers are subtracted from the cells of their respective rows. The column marginals are recalculated, and their deviations from the mean (13.1, -0.0, -9.9, -2.2) are then subtracted from their respective columns. This reintroduces some differences into the new row marginals. And so forth.

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[1] R. E. Patterson, "The Use of Adjusting Factors in the Analysis of Data with Disproportionate Subclass Numbers," Journal of the American Statistical Association, XLI (September, 1946), 334-46.

The series of adjustments are listed in Table 6.6 to show both the rapidity of the convergence and the closeness of the final approximations to the least squares solution.

TABLE 6.6--Series of adjustments in the iterative approximation to the least squares analysis of the effects of fathers' occupations and schools upon median academic achievement

| Cycle | $a_1$ | $a_2$ | $a_3$ | $c_1$ | $c_2$ | $c_3$ | $c_4$ |
|---|---|---|---|---|---|---|---|
| 1 | 28.6869 | .2682 | -10.6314 | 13.0710 | -.0329 | -9.9077 | -2.1918 |
| 2 | -6.8210 | -.1898 | 2.6263 | 2.5954 | -.1903 | -1.3321 | -.7440 |
| 3 | -1.3005 | -.0173 | .4860 | 1.4909 | -.0368 | -.2509 | -.1410 |
| 4 | -.2459 | -.0032 | .0918 | .0928 | -.0070 | -.0474 | -.0267 |
| 5 | -.0464 | -.0006 | .0174 | .0175 | -.0013 | -.0089 | -.0050 |
| 6 | -.0088 | -.0001 | .0033 | .0033 | -.0002 | -.0017 | -.0010 |
| 7 | -.0017 | -.0000 | .0006 | .0006 | -.0000 | -.0003 | -.0002 |
| 8 | -.0003 | -.0000 | .0001 | .0002 | -.0000 | -.0001 | -.0000 |
| 9 | -.0000 | .0000 | .0000 | .0000 | -.0000 | -.0000 | -.0000 |
| 10 | -.0000 | .0000 | .0000 | .0000 | -.0000 | -.0000 | -.0000 |
| 11 | -.0001 | .0000 | .0000 | .0000 | -.0000 | -.0000 | -.0000 |
| Sum | 20.2622 | .0581 | -7.4058 | 16.2717 | -.2684 | -11.5491 | -3.1096 |
| Least squares solution | 20.2622 | .0581 | -7.4058 | 16.2717 | -.2684 | -11.5491 | -3.1096 |

This series of adjustments illustrates a typical pattern which arises when the control variables are correlated. Since we started, optionally, with the A's (fathers' occupations), our initial adjustment was too large, we were taking out some of the effect of the C's (schools) which were confounded. In subsequent iterations this initial adjustment is progressively reduced. In the case of the C's, on the other hand, our first adjustment is too small, since we had already taken out some of the C-effect with the A's. In subsequent iterations this is restored. The final approximations are equivalent to those obtained by the direct solution.

The extension of this iterative procedure to a multi-dimensional array is direct. One merely adjusts for the different levels of each factor in any arbitrary but systematic order, keeping a running sum of the adjustments made for each level of each factor. While analyzing a large array with a desk calculator would be out of the question, the iterative routine is amenable to computer programming. For the six variable problem of Table 6.1 it takes but a scant two minutes on the IBM 704 to converge so that the largest adjustment is less than .0001.

To summarize this methodological digression thus far:

1. The usual cross-tabular procedure used in the analysis of social survey data provides no efficient estimates of main effects--regarding each cell value as a product of specific interactions, even though, most often, the theoretic objective is to demonstrate the generality of a main effect.

2. Regardless of the initial sample size, the introduction of but a few fixed variables results in a large number of vanishing cell frequencies. In this case the assumption of interactions is ordinarily tacitly abandoned, and the generality of the hypothesized main effect is appraised.

a. Intuitive procedures for appraisal are wasteful of the data. The researcher may ignore the magnitude of differences and/or of the cell frequencies. Or he may discard from consideration cells with fewer than some arbitrary number of cases. Or he may impressionistically weigh these considerations but find difficulty in communicating the grounds for his inferences--opening himself to pervasive possibilities of bias.

3. Given the model which is implicitly adopted in this situation, the method of least squares provides "optimal" orthogonal estimates of all main effects (efficiently utilizing all of the data to provide unbiased estimates with minimal (squared) residuals). As a by-product of the method, the warrantability of the assumption of the lack of interactions may be appraised.

a. If the errors may legitimately be construed as random, vigorous tests of significance are available.

4. A simple iterative procedure may be applied to multi-dimensional cross-classification with disproportionate sub-class frequencies which provides estimates which are equivalent to the least squares solution.

Returning to the substance of our discussion, we were concerned with the question of whether a deliberative orientation (indicated by the prudent-immediate scale) had an effect upon academic achievement which was independent of social location. Applying the iterative scheme which has been developed above, the estimates of the independent effects (plus the general mean), of school, fathers' occupations, sex, occupational and educational aspirations, and P-I scale scores upon the median academic achievement of high school students are reported in Table 6.7.

TABLE 6.7--Estimated orthogonal effects of six variables upon the percentages of high-school students attaining high (A or B) median academic grades

| Variable<br>Category | Effect |
|---|---|
| School stratum | |
| A | 46% |
| B | 33 |
| C | 30 |
| D | 37 |
| Father's occupation | |
| Professional & executive | 43 |
| White collar & merchant | 36 |
| Manual & artisan | 34 |
| Sex | |
| Boy | 27 |
| Girl | 47 |
| Occupational aspiration | |
| Professional or executive | 45 |
| White collar or merchant | 32 |
| Manual or artisan | 30 |
| Educational aspiration | |
| College | 48 |
| Non-college | 22 |
| Prudent-immediate scale scores | |
| Prudent 3 | 48 |
| 2 | 38 |
| 1 | 32 |
| Immediate 0 | 27 |
| Mean | 36% |

The results of this analysis leave no doubt that both the "ascribed" and the "psychological" variables have clear and independent consequences for achievement.

Since the items of the prudent-immediate scale were written to discriminate deliberate from immediate social orientations, we would expect this scale to be more relevant to achievement in social studies and English, say, than to mathematics and science. When we apply this same procedure to the analysis of grades in different subject areas, we get the results which are tabulated for comparison in Table 6.8.

TABLE 6.8--Estimated effects[a] of the prudent-immediate scale upon median achievement in three subject areas

| Subject Area | Prudent<br>3 | 2 | Immediate<br>1 | 0 | Mean |
|---|---|---|---|---|---|
| Social studies & English | 51% | 41% | 36% | 29% | 39% |
| Mathematics | 38 | 34 | 34 | 29 | 34 |
| General science | 48 | 39 | 34 | 36 | 39 |

[a] Estimates, again, are independent of the effects of school, fathers' occupation, etc.

Examination of the residual interaction derived from the set of tables involving the cross-tabulations of all of these achievement variables with the various control variables shows a consistent and substantial difference between differences. The discrepancy in achievement between boys and girls is considerably larger in the lower stratum schools than in the upper. Space does not permit illustrating this with the entire series of multi-dimensional tables involved, but, it can be clearly seen in the direct two-way tabulation of schools and sexes in Table 6.9.

TABLE 6.9.--Percentages of high-school students receiving high (A or B) median academic grades according to sex and school strata

| School Stratum | Boys | Girls | Total |
|---|---|---|---|
| A | 54%<br>(333) | 58%<br>(122) | 55%<br>(455) |
| B | 29<br>(341) | 42<br>(316) | 35<br>(657) |
| C | 14<br>(332) | 35<br>(336) | 25<br>(668) |
| D | 25<br>(480) | 47<br>(383) | 35<br>(863) |
| Total | 30%<br>(1486) | 43%<br>(1157) | 36%<br>(2643) |

This same interaction between sex and school was in evidence among the sixth grade students--the boys being awarded almost as many high marks as the girls in the Hills schools, but falling far behind in the Flats.

This differential behavior reflects the greater difficulty which working-class boys have in role identification than either girls or middle-class boys. Middle-class fathers have come to share parental responsibilities more and more, while home is yet characteristically matriarchal among working-class people.[1] This estrangement of the working-class boy from the adult world is congruent with our earlier findings that he is more integrated in, and influenced by, his peer group.

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[1] See e.g., Melvin L. Kohn and Eleanor E. Carroll, "Social Class and the Allocation of Parental Responsibilities," Sociometry, XXIII (December, 1960), 372-92; and Kohn, "Social Class and Parental Values," American Journal of Sociology, LXIV (January, 1959), 337-51.

When we look at the elementary school sample, however, a new aspect to the picture emerges. Here we find that social location has an impact upon achievement as measured by standardized tests, but that the independent effect of expressed aspirations is smaller, and of prudent vs. immediate orientations is non-existent. These effects are listed in Table 6.10.

TABLE 6.10.--Estimated orthogonal effects of six variables upon mean achievement test scores of Berkeley sixth-grade students

| Variable<br>Category | Reading | California Test of<br>Arithmetic | Mental Maturity |
|---|---|---|---|
| School stratum | | | |
| Hills | 102 | 78 | 121 |
| Foothills | 99 | 72 | 117 |
| Flats | 85 | 64 | 108 |
| Father's occupation | | | |
| Professional & executive | 101 | 76 | 121 |
| White collar & merchant | 97 | 75 | 119 |
| Manual & artisan | 92 | 67 | 110 |
| Sex | | | |
| Boy | 93 | 72 | 116 |
| Girl | 99 | 73 | 117 |
| Occupational aspirations | | | |
| Professional or executive | 100 | 73 | 117 |
| White collar or merchant | 95 | 72 | 116 |
| Manual or artisan | 95 | 68 | 115 |
| Educational aspirations | | | |
| College | 98 | 73 | 118 |
| Non-college | 92 | 70 | 112 |
| Prudent-immediate scale scores | | | |
| Prudent 3 | 97 | 75 | 120 |
| 2 | 96 | 72 | 116 |
| 1 | 96 | 72 | 115 |
| Immediate 0 | 98 | 72 | 116 |
| Mean | 96 | 72 | 116 |

However, in Table 6.11 we see that attitudes (and sex) have a large impact upon the evaluations which teachers make of achievement. The teachers apparently place a value upon attitudes beyond their reflection in measurable achievement. It would be interesting to see if this is as true in the more impersonal high school situation.

TABLE 6.11.--Estimated orthogonal effects of six variables upon teacher evaluations of the achievement of sixth-grade students

| Variable Category | Subject Area | | | |
|---|---|---|---|---|
| | Reading | Social Studies | Arithmetic | Science |
| School stratum | | | | |
| Hills | 48% | 47% | 45% | 50% |
| Foothills | 61 | 64 | 54 | 58 |
| Flats | 41 | 39 | 47 | 45 |
| Father's occupation | | | | |
| Professional & executive | 61 | 59 | 61 | 69 |
| White collar & merchant | 56 | 53 | 54 | 57 |
| Manual & artisan | 35 | 38 | 33 | 32 |
| Sex | | | | |
| Boy | 43 | 45 | 45 | 45 |
| Girl | 56 | 54 | 51 | 57 |
| Occupational aspiration | | | | |
| Professional or executive | 54 | 53 | 52 | 53 |
| White collar or merchant | 48 | 47 | 46 | 51 |
| Manual or artisan | 40 | 45 | 40 | 42 |
| Educational aspiration | | | | |
| College | 52 | 52 | 51 | 54 |
| Non-college | 41 | 41 | 38 | 41 |
| Prudent-immediate scale scores | | | | |
| Prudent 3 | 62 | 60 | 60 | 63 |
| 2 | 50 | 50 | 51 | 48 |
| 1 | 47 | 45 | 42 | 50 |
| Immediate 0 | 40 | 46 | 41 | 46 |
| Mean | 50% | 49% | 48% | 51% |

Since a different instrument was used with the elementary school students, the question arises as to whether we have a real difference in effects or only a difference in measurement. To explore this question both the high school and elementary school instruments have been administered to these students (now in the eighth and fifth grades). Pending the analysis of these returns no decisive answer can be given. But the contrast between teachers' evaluations of sixth and third grade students is strongly suggestive of a real change in the relationship. While in the sixth grade the "prudent" students receive a higher proportion of good marks, among third graders this is reversed--the immediate students receiving more high marks. This would seem to indicate that the requirements for early success in school are responsiveness and docility, while only later does deliberation play a role.

While this a posteriori interpretation is manifestly speculative, and our original research plan was not designed to explore this question, the discontinuity in educational expectations through the grades along this dimension is an important question for future exploration. In follow-up interviews with 92 of the sixth-grade boys the following year (when they were in the seventh grade), the great majority of the boys who had been classed as "immediate" reported that they had never been interested in anything a teacher ever said;[1] and there were clear differences between them and the "prudent" boys in their perception of their peers interest in school work.

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[1] Only 1/12 of the "immediate" boys, as contrasted with 1/3 of the "prudent" and 2/3 of the "theoretic" boys reported any sustained interest.

TABLE 6.12.--Percentages of students receiving high marks by prudent-immediate scale scores: Berkeley elementary-school students, classified by grade level and sex

| Grade | Sex | Subject | Prudent | | | Immediate | Total |
|---|---|---|---|---|---|---|---|
| | | | 3 | 2 | 1 | 0 | |
| Six | | | | | | | |
| | Boys | | | | | | |
| | | Reading | 58% | 40% | 42% | 32% | 42% |
| | | Arithmetic | 57 | 45 | 39 | 32 | 42 |
| | Girls | | | | | | |
| | | Reading | 65 | 55 | 48 | 55 | 53 |
| | | Arithmetic | 57 | 52 | 44 | 52 | 49 |
| Three | | | | | | | |
| | Boys | | | | | | |
| | | Reading | 40 | 27 | 51 | 53 | 44 |
| | | Arithmetic | 40 | 36 | 49 | 64 | 48 |
| | Girls | | | | | | |
| | | Reading | 55 | 52 | 64 | 75 | 61 |
| | | Arithmetic | 45 | 46 | 49 | 70 | 51 |
| | | | Number of Cases | | | | |
| Six | | | | | | | |
| | Boys | | 67 | 141 | 122 | 75 | 405 |
| | Girls | | 49 | 136 | 184 | 42 | 411 |
| Three | | | | | | | |
| | Boys | | 10 | 44 | 59 | 36 | 149 |
| | Girls | | 11 | 56 | 83 | 20 | 170 |

As one "immediate" boy said, "I like school, but I don't like homework."[1] At an earlier stage in their school career this attitude might have been quite appropriate.

## Specialization of Interests

One of the foci of this investigation into the factors affecting academic achievement in the public schools has been the influence of subject preferences. In a pilot study which was the point of departure for the present investigation it was found that among the students enrolled in the chemistry and physics sections of a Bay Area high school, those who preferred the humanities to science were more successful students than those who expressed a preference for science.[2]

In the follow-up study using a much larger sample of students, this pattern is no longer clear. Rather we find a curvilinear relationship--both in the initial cross-tabulation and when many other variables are introduced. The original tabulation of the percentages of students receiving high median grades according to their prudent-theoretic scale scores is shown in Table 6.13.

TABLE 6.13.--Percentages of students receiving high median academic grades by sex and prudent-theoretic scale scores

| | Prudent | | | Theoretic |
|---|---|---|---|---|
| Sex | 3 | 2 | 1 | 0 |
| Boys | 32%<br>(193) | 22%<br>(677) | 24%<br>(667) | 35%<br>(420) |
| Girls | 51<br>(401) | 39<br>(929) | 37<br>(345) | 45<br>(78) |
| Total | 45%<br>(594) | 32%<br>(1606) | 29%<br>(1012) | 36%<br>(498) |

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[1] Interview No. 1226.

[2] T. Bentley Edwards and Alan B. Wilson, "The Specialization of Interests and Academic Achievement," Harvard Educational Review, XXVIII (Summer, 1958), 183-96.

In Table 6.14 estimates are made of the orthogonal effects of prudent vs. theoretic interests, along with status and aspirational variables which have been considered before, upon grades in various subject areas. We see here that while the composite effect of the scale scores is curvilinear, interests are somewhat associated with achievement in the expected subject areas (see Appendices A and C).

TABLE 6.14.--Estimated orthogonal effects of six variables upon high-school students' median grades

| Variable<br>Category | | Social Studies & English | Math | Median Grades |
|---|---|---|---|---|
| Prudent-theoretic scale scores | | | | |
| Prudent | 3 | 44% | 31% | 38% |
| | 2 | 40 | 31 | 33 |
| | 1 | 36 | 35 | 35 |
| Theoretic | 0 | 37 | 41 | 39 |
| School stratum | | | | |
| A | | 48 | 41 | 42 |
| B | | 35 | 31 | 33 |
| C | | 33 | 28 | 30 |
| D | | 43 | 35 | 37 |
| Father's occupation | | | | |
| Professional & executive | | 47 | 39 | 45 |
| White collar & merchant | | 41 | 34 | 35 |
| Manual & artisan | | 36 | 31 | 33 |
| Sex | | | | |
| Boy | | 28 | 29 | 25 |
| Girl | | 53 | 40 | 48 |
| Occupational aspiration | | | | |
| Professional or executive | | 50 | 43 | 44 |
| White collar or merchant | | 35 | 29 | 32 |
| Manual or artisan | | 31 | 24 | 29 |
| Educational aspiration | | | | |
| College | | 52 | 40 | 48 |
| Non-college | | 25 | 20 | 21 |
| Mean | | 39% | 34% | 35% |

At the high school where the pilot study had been conducted, the larger sample of 1958 again showed the prudent students faring better, on the average, than the theoretic, but at some other high schools the trend was clearly reversed. Contrasting the percentages receiving high grades at the "Group B" schools (from which the pilot study sample was drawn) with the percentages at a predominantly Negro high school illustrates this difference.

TABLE 6.15.--Percentages receiving high (A or B) median academic grades by prudent-theoretic scale scores at "Group B" high schools and at a predominantly Negro "Group C" school

| | Prudent | | | Theoretic |
|---|---|---|---|---|
| School | 3 | 2 | 1 | 0 |
| Group B schools | | | | |
| 1 | 48%<br>(140) | 33%<br>(269) | 31%<br>(131) | 35%<br>(61) |
| 2 | 47<br>(56) | 36<br>(170) | 18<br>(110) | 20<br>(44) |
| Group C schools | 14<br>(38) | 14<br>(130) | 21<br>(102) | 29<br>(41) |

In examining literally hundreds of cross-tabulations of these scale scores with other variables in our several samples, there seems to be some tendency for the more talented members of less privileged groups to gravitate toward science rather than the humanities.

In the high-school study if we look at the percentages of boys scoring 120 or over in IQ tests, classified by their orientations and their fathers' occupations, we find that among the middle-class boys the prudent students have the highest scores while among the sons of manual workers this is not so.

TABLE 6.16.--Percentages of boys with IQ scores of 120 and over by fathers' occupations and prudent-theoretic scale scores

| | Prudent | | | Theoretic |
|---|---|---|---|---|
| Father's occupation | 3 | 2 | 1 | 0 |
| Professional & executive | 44%<br>(32) | 36%<br>(75) | 34%<br>(82) | 25%<br>(60) |
| White collar & merchant | 25<br>(44) | 15<br>(157) | 13<br>(169) | 25<br>(101) |
| Manual & artisan | 7<br>(59) | 10<br>(227) | 6<br>(216) | 14<br>(129) |

An analogous reversal is manifest when we compare the association between interests and achievement among sixth and third grade elementary school students. The sixth grade students oriented toward the humanities do definitely better in reading, and hold their own in arithmetic, while in the third grade, the boys preferring science are by far the better students in both subject areas.

TABLE 6.17.--Percentages of Berkeley elementary-school boys receiving high marks in reading and arithmetic by prudent-theoretic scale scores

| Grade level | | Prudent | | | Theoretic | |
|---|---|---|---|---|---|---|
| | Subject | 3 | 2 | 1 | 0 | Total |
| Six | | | | | | |
| | Reading | 48%<br>(25) | 48%<br>(82) | 41%<br>(138) | 39%<br>(160) | 42%<br>(405) |
| | Arithmetic | 44<br>(25) | 50<br>(82) | 40<br>(138) | 41<br>(160) | 42<br>(405) |
| Three | | | | | | |
| | Reading | --<br>(8) | 29<br>(34) | 42<br>(45) | 52<br>(62) | 44<br>(149) |
| | Arithmetic | --<br>(8) | 32<br>(34) | 49<br>(45) | 58<br>(62) | 48<br>(149) |

One of the central hypotheses on the basis of which this research project was launched was that traditionally organized schools tend to reward--and select for advancement--those students with a verbal and humanistic bent, to the disadvantage of students whose interests are more in concrete tangible things. While we have found, over-all, a curvilinear relationship, with many students having scientific interests doing very well indeed in high school, there is a progressive tendency as children advance through the grades and in the middle-class high schools, for the prudent to be differentially rewarded.

This "civilizing" effect of the schools is especially apparent in England where children are selected at the age of 11+ for training in the grammar schools, and offered the opportunity to subsequently enter positions of social responsibility and reward, on the basis of tests of achievement in which verbal skills play a dominant role. Those children who are retained through the fifth and sixth forms have either acquired, or have been selected on the basis of, developed humanistic interests.

TABLE 6.18.--Percentages of British secondary school students expressing a preference for reading Shakespeare over Faraday according to form and type of school

| | Type of School | | |
|---|---|---|---|
| Form | Grammar | Modern | Both |
| Three | --<br>(0) | 23%<br>(96) | 23%<br>(96) |
| Four | 29%<br>(35) | 39<br>(64) | 35<br>(99) |
| Five | 47<br>(130) | --<br>(0) | 47<br>(130) |
| Six | 52<br>(262) | --<br>(0) | 52<br>(262) |
| All forms | 49%<br>(427) | 29%<br>(160) | 43%<br>(587) |

In the American high schools also, although less pronounced, students in the higher grades express more prudent interests than those in the lower grades. The percentages, for example, who prefer Shakespeare to Faraday for each grade are:

| Grade | Per cent preferring Shakespeare |
|---|---|
| 10 | 25%<br>(571) |
| 11 | 31<br>(767) |
| 12 | 34<br>(517) |

To summarize, among children in the primary grades, those with theoretic interests are more successful in school tasks. As they progress through school those with literary or humanistic interests come to excel. It is no coincidence that it is in the primary grades, in the working-class high schools, and in the modern schools of England, that a relatively greater pedagogical emphasis is placed upon concrete experience and manipulative activity. These elementary theoretic interests are more primitive for most children.

Yet we have found that students with theoretic interests do better in science and mathematics than students with more catholic tastes. When selection for advanced training is made on the basis of over-all academic accomplishment, there is a waste of specialized talents.

## VII. SOME QUALITATIVE INSIGHTS

In prior chapters we have been seeking to establish the gross average effects of demographic attributes, the peer group, attitudes, and specialized interests upon academic achievement. Some of the more interesting insights into student achievement come from examining the effects of complex combinations of attributes, and from qualitative interview materials which cannot be adequately represented by numerical tabulation.

In the spring of 1960 interviews of about one-half hour duration were conducted with 92 of the boys in the elementary school sample. In these interviews we tried to explore further the interests of the student, his reactions to the school curriculum, his perceptions of his teachers' and peers' attitudes, and the influence of his family. We also briefly quizzed each student about some current events to get an idea of how well-informed and alert the students were to significant political events and figures, and demonstrated a simple optical phenomenon (refraction of light), calling for an explanation.

Many of the results, of course, served to provide "clinical", personalized confirmation of influences which had earlier been made from statistical tabulations. The students at the predominantly middle-class junior high school, whose parents were better educated, were more alert and articulate, better informed, and, generally, showed quicker insight into the optical demonstration (or had already picked up and retained an explanation). The better students not only expressed more personal interests in school-work, but also perceived their classmates as being more interested. This is not just a projection of values, of course. The best students are found in selected accelerated groups in which the pupils are in fact more lively and interested in their work.

## Consistency and commitment

One characteristic distinguishing the boys who offered satisfactory solutions to the optics problem was the strength and consistency of their commitment to science. They often had very concrete scientific or technological occupational specializations in mind about which they had considerable information--and sometimes, even, some practical experience. Others, who were unsuccessful in the experiment, might likewise say they wanted to be scientists, but their interest would be more amorphous. They might never have bothered to read a book in science; they might choose, say, social studies as a favorite subject because they prefer that particular teacher's sense of humor; and they would be less likely to have thought through the training program which would lead them to their expressed occupational preference.

But it was not only a commitment to physical science per se which was associated with alertness and insight into the experiment. One young seventh-grade boy, for example, wanted to be an archeologist. He had spent several summers at "diggings" in New Mexico, and had read many volumes on ancient civilizations, Indian cultures, and history. He had up-to-date information about the situation in Algeria and de Gaulle's apparent intentions; and intelligently argued the moral and social issues bearing on capital punishment (which was a "current event" because of Chessman's recent execution). He too encountered no difficulty in explaining refraction.

To confirm this apparent relationship between "commitment" and achievement which was a qualitative judgement, the grades of the high school boys were cross-classified by their prudent-theoretic scale scores and their stated subject preferences. This tabulation is shown in Table 7.1.

TABLE 7.1.--Percentages of high-school boys receiving high (A or B) median academic grades by prudent-theoretic scale scores and favorite subject

| Favorite subject | Prudent<br>3 | 2 | 1 | Theoretic<br>0 |
|---|---|---|---|---|
| English, social studies, language | 63%<br>(62) | 37%<br>(179) | 28%<br>(103) | 29%<br>(24) |
| Mathematics, biology, chemistry, general science | 28<br>(53) | 25<br>(228) | 35<br>(311) | 43<br>(282) |

The boys who select a favorite subject which is congruent with their scaled interests do better in academic work than those who are inconsistent (and, incidentally, those who are consistently oriented toward the humanities do better than those consistently oriented toward science). This also casts light on why a curvilinear relationship was so often found between achievement and P-T scale scores. The extreme scale scores correlating with high achievement were attained by those answering nearly all of the set of related items consistently. Those who are undecided, or may not have clear interests in either alternative, would tend to fall at the intermediate points, correlating with low achievement.

Following this line of reasoning, if we take those who are most prudent (3) on the prudent-immediate scale as those who are likely to have deliberative interests of some sort, while those most immediate (0) as likely to be disinterested in academic work in general, and tally the median grades of these two groups according to their P-T scale scores we find that among the deliberative students more of those oriented toward the humanities are rewarded with high grades, while among the non-deliberative (disinterested) the grades are rather uniformly low.

TABLE 7.2.--Percentages of high-school students with extreme P-I scale scores receiving high (A or B) median academic grades according to their prudent-theoretic scale scores

| Prudent-immediate scale scores | Prudent | | | Theoretic |
|---|---|---|---|---|
| | 3 | 2 | 1 | 0 |
| Prudent: 3 | 69%<br>(130) | 55%<br>(203) | 54%<br>(103) | 50%<br>(64) |
| Immediate: 0 | 22<br>(49) | 16<br>(204) | 17<br>(137) | 20<br>(55) |

Influence of fathers

Returning, now, to the lessons to be learned from the interviews with the boys in the seventh grade, those who successfully solved the optics problem were distinguished from their unsuccessful compeers in that they attributed a different set of characteristics to their fathers. Many of these attributes, of course, reflected the attainments and "high-" or, at lease, "middle-brow" tastes of the fathers: e.g., they had more education, owned more books (and read more), watched less television and curtailed their son's viewing time, etc.

But an interesting (and unexpected) pattern was that the successful boys reported significantly fewer father-son "activities"--things they could mention in response to the question, "How often do you do things with your father?" (Fishing, trips, baseball games, picnics, are the sort of things which came to the boys' minds.) Less than one-fifth of the boys who gave acceptable solutions to the experiment reported "doing things" with their fathers regularly, as contrasted with over a half of those who couldn't figure out an explanation. But these fathers who didn't "do things" with their sons had typically distinct patterns of leisure activities. Rather than watching TV, socializing, or taking the boy or family out regularly, they were the domestic putterers--gardening, repairing the house, putting up an annex, building a boat in the back yard, making models, or running a ham radio station.

In some way this concrete manipulative orientation, and probably competence, of the father communicates to the son an interest in and indight into tangible events. However productive the father in the world of business or ideas or at the factory, the apprenticeship of the son to manhood, and a significant lesson on the value of life, comes from the father's use of leisure.

Social commentators have pointed out the alienation of youth from adult society, the want of a productive role, the disconinuity in expectations and responsibility. But the exemplary vacuum is in the lives of adults who, given the choice, would escape rather than create. Not only does leisure reflect the father's choice, but, ordinarily, it is the only vivid conception the son has of his father.

# VIII. SUMMARY

The starting point of the present research has been the assumption that a deliberative orientation, an interest in learning for its own sake, significantly affects student achievement in school. Data concerning student interests, environmental characteristics, and academic achievement, have therefore been collected and comparisons made among the data.

The most significant findings of the research herein reported have been presented in the body of the text under four headings: the influence of the peer group, the effect upon achievement of an interest in deliberate mental activity, the specialization of these interests as being socially or non-socially oriented, and the influence of the status and style of life of the father.

The influence of the peer group has been examined on the basis of sociometric inventories administered to more than a thousand elementary school children. Peer groups of children from lower-class families are more tightly knit than are those from middle-class families. Hence, the peer group becomes the significant reference with respect to attitudinal development among children from the lower socio-economic sections of the population.

Deliberative orientations are a strong positive influence upon school achievement. Motivation to work hard in school is complex as are human motivations generally. To some extent, children study in order to realize vocational aspirations having educational prerequisites. They also study in return for approval by parents, teachers, and other adults. Nevertheless, using information obtained with the P-I (prudent-immediate) scale, tables of data were presented showing a clear-cut relationship between high prudent scores and high achievement.

The relationship of specialization of interest to achievement was investigated with the help of P-T (prudent-theoretic) scales. Because those with theoretic interests are more frequently encountered in the primary grades, in working-class high schools, and in the modern schools of England, the conclusion is inevitable that theoretic interests are in some as yet undefined way more primitive than prudent interests. The manipulation of concrete objects can lead more directly to a need for ideas than contact with persons can lead to a need for ideas concerning social relationships. To the naive intellect, social behavior either makes no insistent demand for explanation, or else the explanations are so obvious that they can be grasped intuitively. Adults from the middle and upper classes, a category which includes many teachers, look with favor on a prudent orientation. Hence, except in the primary grades, and in schools catering exclusively to the working classes, school programs fail to distinguish between those with theoretic orientations and those which are essentially non-deliberative. As a result, present curricular and pedagogical procedures are probably less efficient than they might be with certain culturally deprived children.

Influence of the father upon the development of deliberative interest was explored in depth by means of structured interviews with 92 boys. A panel study along these lines is contemplated. At least one significant finding has been reported. This is that boys develop theoretic interests more readily if the father putters around the home, doing minor repairs, making furniture and so on, rather than engaging in leisure activities in which both share on more or less even terms as they do when camping, fishing, or watching athletic contests.

Those interested in an extended description of the chronology and methodology of the research that resulted in the findings reported should find Appendix A to be of interest. In it, the entire story of the research is presented so that the formation of the scales, the populations sampled, and data collected and treated can be fully comprehended.

A tangible result of the present research has been the preparation of a number of instruments. All of these are reproduced in Appendix B. The most important are the various forms of the Inventory of Choices. Questions of validity and reliability are discussed in Appendix C. By way of summary it can be stated that these Guttman-type scales provide information that is highly reproducible. The most important scale, the P-T scale, was recovered practically intact by factor analysis of responses from 3750 high school students. Scores on this scale correlate in the expected fashion with vocational and educational aspirations.

Details for the coding of categories of occupations have been developed during the present investigation. The list provided in Appendix B, although built upon schemes adopted in a wide variety of studies, is probably among the most advanced stages in the evolution of this complex research procedure.

New computational routines for the treatment of sociometric data and factor analysis have been worked out by the junior author. They have already been added to the repertoire of other researchers in the behavioral sciences. Use of these procedures has been referred to in Appendix C, as well as in the body of the text. Details concerning these procedures may be obtained by writing directly to Alan B. Wilson, Department of Education, University of California at Berkeley.

The research reported has raised far more questions than it has answered. The possibilities for future research will be indicated as they relate to the development of instruments, to a panel study of motivations, and to estimates of variations in school programs.

Data has already been collected for cross-validation of the elementary and high school forms of the inventory by asking a sample of over 1000 children in grade eight to respond during the same class period to the items on the two forms. Because these children are the ones who responded to the elementary form two years ago when they were in grade six, some data with which to determine test-retest reliability are now available.

Replication studies checking the validity and reliability of our findings are anticipated. A number of graduate students in our own institution have expressed interest in the use of our scales for research purposes.

Some extension of the international aspect of the research can certainly be expected. The senior author has plans afoot to use the American edition with Canadian students and the British edition with students in Australia and New Zealand.

Determinations of attitudes will continue to be made as the panel study is continued with as many of the sample of 92 boys as can be kept under surveillance. At least fifty per cent of these students can be expected to remain within reasonable distance, and because the sample contained a large number of high achievers, a fairly large proportion of the boys can be expected to continue their education in one of the institutions of higher education in the San Francisco Bay Area.

Of exceptional interest would be research designed to demonstrate variations in attitudes known to accrue from curricular and pedagogical modifications. With increasing numbers of programs available for automatic tutors, a sharp increase in the reliability of such research can be anticipated.

# APPENDICES

# APPENDIX A

# CHRONOLOGY AND METHODOLOGY OF THE RESEARCH

# APPENDIX A

## CHRONOLOGY AND METHODOLOGY

### The stimulus

The present research into the dynamics of individual learning began in the spring of 1955. For nearly a year, a researcher spent two or three days a week in a large local high school paying particular attention to the problems of providing curricular variations suited to the talents of those children who were succeeding easily in their high school classes and who would probably go on to attend college and university.

With a committee of teachers, the details of several new courses were worked out, and groups of students were selected to take these courses. In one of them, talented students spent two periods consecutively with the same teacher investigating topics commonly found in separate courses in chemistry and physics. In another two-hour block, content from mathematics was combined with content from chemistry, and in a third, with content from physics. An experimental course in the humanities emphasized class discussions of literary masterpieces in the list of which philosophical writings predominated.

Two problem areas were identified during this preliminary period of close contact with the schools; problems having to do with selection of students for special treatment and those concerned with the assessment of curricular modifications. The two problem areas may be connected theoretically through the concept of motivation. Children selected for special educational opportunities must be motivated as well as academically talented and one of the major purposes of high school education is surely to develop buds of interest into full-scale commitment to intellectual activity.

The response

In May, 1956, the co-author of this report was persuaded to join a project which was almost completely undefined. However, a grant from the Department of Education of the University of California permitted him to spend all of his time during a period of several months familiarizing himself with previous activity in the general area of motivation. Among the more helpful works in this regard were: Gordon W. Allport, Personality, New York: Henry Holt and Company, 1937; Solomon Asch, Social Psychology, New York: Prentice-Hall, Inc., 1952; Kenneth Burke, Permanence and Change, Los Angeles: Hermes Press, 1954; Henry W. Nissen, "The Nature of Drive as Innate Determinant of Behavioral Organization," Nebraska Symposium on Motivation, 1954, ed. by Marshall R. Jones, Lincoln: University of Nebraska Press, 1954.

These were discussed at considerable length with the project director and eventually the limitations of the various theories of motivation were set forth. No clear way could be seen at this point to resolve the various difficulties on a purely rational basis.[1] The decision was therefore taken to investigate attitudinal orientations empirically, leaving aside, temporarily, questions concerning the origins of these orientations and the precise manner in which they are able to account for the energy that is evidently required to carry out the work needed to learn.

To the extent that behavior is purposeful, choices must be made. This statement is true regardless of the level of awareness of the actor concerning his needs, and regardless of the extent of his freedom. Human beings may have needs of which they are unaware. Further, they may respond to these, or to needs of which they are at least dimly aware, in such a manner that their behavior is consistent but unpremeditated. To the extent that such ways of behaving are acquired, the description of behavioral characteristics and the method of acquisition of these characteristics become grist for the mill of educational theory. To the extent that such characteristics influence the life of the actor in and out of school, they must be considered in an empirical investigation of attitudinal orientations.

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[1] T. Bentley Edwards and Alan B. Wilson, "Attitudes Toward the Study of School Subjects," Educational Theory, VIII (October, 1958), 275-84.

However, student behavior is difficult and costly to measure. The more usual procedure, in motivational research, is to measure how people say they would respond to a given situation. Presumably, written responses to written descriptions of situations are valuable empirical data in and of themselves. Conceivably, generalizations could eventually be supported linking these written responses to overt behavior. However, the learning activities undertaken in schools are nearly all vicarious so that pencil and paper tests of motivation need no apology concerning their usefulness in educational research.

Most of the activities of formal education are concerned with deliberate choice. Ideally, the child is provided with the information, skills, and abilities needed in order for him to be able to test and analyze in his mind the various consequences that will follow a certain choice of behavior. The schools may also try to see that he acquires a liking for this kind of deliberative activity. Where they do, they not only provide learning, they also generate the energy needed for its acquisition.

The schema

Educational procedures and activities do not fall neatly into two compartments, one deliberative, and the other non-deliberative. Instead, there is a dimension along which educational activities may be ordered according to the consideration for mental activity that is involved. Some of the activities of the school are well over toward the non-deliberative end and the schools have been criticized for being non-intellectual so far as these activities are concerned. Deliberation is only possible, however, when the student is able to understand and to apply the ideas that he has learned in school.

These ideas may be analyzed as they apply to the social or non-social environment. A two-dimensional surface with four poles is thereby postulated. The model is not only useful to consider the various disciplines that are taught in school; it also applies to the attitudinal orientations of students.

Names for the four poles are difficult to choose, and those finally selected will undoubtedly be criticized. However, their use is a matter of convenience, for the names do not appear in any of the test materials used with students, nor are the names used in the treatment of data. The following names have been chosen:

| | |
|---|---|
| PRUDENT | A deliberative orientation toward the social environment |
| IMMEDIATE | Non-deliberative toward the social environment |
| THEORETIC | Deliberative toward the non-social environment |
| AESTHETIC | Non-deliberative toward the non-social environment. |

On a two-dimensional surface there are an infinite number of points and each of these points may be contrasted with another. Throughout this investigation, no more than six sets of comparisons have been attempted: prudent-theoretic, prudent-immediate, prudent-aesthetic, theoretic-immediate, theoretic-aesthetic, and aesthetic-immediate.

## The instruments

To assess attitudinal orientations according to a dimension such as the prudent-theoretic, a scale is needed. A common device for the construction of psychological scales is the question which offers the student a choice of two alternatives. One of the poles can be implied, or it may be presented explicitly. Either way, the question appears as a declarative statement with which the student can express either agreement or disagreement.

Thirty items were prepared for each of the six dimensions listed previously, making a total of one hundred and eighty items. They were culled during discussions between both researchers from a large reservoir of suggested items written independently by them. Attention was paid to clarity of wording, suitability of vocabulary, homogeneity of the ideas presented, and absence of ambiguity. A wide variety of positions were contrasted and, so far as possible, all of the positions described were socially acceptable. However, positions with varying degrees of popularity were chosen deliberatively.

Interspersion of the writing and discussion periods was useful in the development of definitions for the various poles. Further, the definitions sought were to be in terms that might be chosen by adolescents rather than adults. The "theoretic" position is conceived essentially as that of the scientist. However, the view of this position as comprehended by the high school student must necessarily be distorted. He is not a scientist. The task confronting those who were preparing the items was to grasp the point of view of those students who might later develop the mature interests of the practicing scientist. For example, scientists generally may not be interested in the internal functioning of such technological devices as television sets and computing machines. The view was taken, however, that such interests manifested in adolescence could be read as signs pointing to the possible development of a mature interest in scientific theory. The proven homogeneity of items concerning technical interests with those indicating interest in negative matter, in the researches of Michael Faraday and in science and mathematics rather than history and civics, is taken as empirical support for this point of view.

During these preliminary discussions the problem of the persistence of a given pole as represented in three different scales was given careful consideration. The method of scaling to be employed was known to demand variation in popularity of items. This must mean that varying positions along a given dimension are to be contrasted. Hence, the prudent pole, for example, must vary among the items of the prudent-theoretic scale. If a given pole is to shift within a given scale, it can be expected to shift in going from scale to scale. As far as could be determined by long discussions of the meanings to high school students of various items, the generality of the term "prudent", for example, was retained in each of the three scales: prudent-theoretic, prudent-aesthetic, and prudent-immediate.

That the conception of this important point was not completely clear at this stage in the development of the investigation may be seen by looking at the second item quoted below. "Reading" may be about science. However, students in high school do not associate science with matters of opinion, and they tend not to think of reading as being the typical activity of scientists.

No experimental evidence was obtainable with the high school inventory concerning this important point, until the high school inventory was given at the same time to the same students. As will be seen, this respondence to both inventories by the same pupils at the same sitting has but just occurred, and the evidence will have to be presented in later reports.

Examples of the various scale items follow:

| | |
|---|---|
| Prudent-theoretic | I am more interested in finding out how TV has affected people's taste than in finding out how TV works. |
| Prudent-immediate | The opinion of friends helps more than reading in making up my mind. |
| Prudent-aesthetic | I find painting interesting when I am able to see how they represent the artists' attitudes toward life. |
| Theoretic-immediate | If I were employed by a company manufacturing chemicals, I would rather stay in research than become a company executive, so long as the loss in pay was not too great. |
| Theoretic-aesthetic | School mathematics courses should concentrate more on practical consumer and business training. |
| Aesthetic-immediate | I enjoy swimming in the ocean by myself, or, for safety, with a companion or life guard, more than swimming in a pool. |

No factual items were included in the list of one hundred eighty items for responses to such items would reflect knowledge chiefly and attitudes only indirectly. Items in a given scale were so worded that approximately half of the items called for agreement with one pole of the dimension, and half called for agreement with the other pole. The 180 items were randomized with the provision that no two items from the same scale should be adjacent. The "Inventory of Choices" was mimeographed in a numbered list with no provision for responding to the items on the booklet itself. Instead, separate answer sheets were provided which consisted of the numbers 1-180 with each of these numbers followed by the first six letters of the alphabet. Directions called for a response of "strongly agree" to be indicated by a cross on top of the letter "A", "moderately agree" with a cross on the letter "B", "slightly agree", "C", "slightly disagree", "D", "moderately disagree", "E", and "strongly disagree", "F".

Response categories on this Likert type six-point forcing scale were assigned the arbitrary weights, 5 - 0. "Strongly agree", to positively phrased items, or "strongly disagree" to negatively phrased items were assigned the weight of 5.

Item selection

Nearly 100 students in a required high school biology course, and half as many undergraduates in a university education course took the experimental form of the inventory. The high school students were from four sections roughly stratified according to IQ and prior achievement.

Following Louis Guttman's "Cornell technique",[1] twelve tables were laid out, one for each scale for each of the two samples separately. Each table was constructed with one column for each of the six response categories of each item, and one row for each individual in the sample. Thus, since each scale had thirty items and each item contained six response categories, each table consisted of 180 columns and as many rows as individuals in the sample. The individuals were ordered, high to low, for each scale, according to their summated scores, and listed vertically down the left side of each table. The responses of each individual to each item were indicated by X's in the appropriate cells, the resulting tables containing all of the data gathered.

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[1] Louis Guttman, "The Cornell Technique for Scale and Intensity Analysis," Educational and Psychological Measurements, VII (Summer, 1947), 247-79; republished in C. West Churchman, et al., Measurement of Consumer Interest (Philadelphia: University of Pennsylvania Press, 1947), pp. 60-84.

The array of responses to each item was double-dichotomized; vertically by combining response categories (e.g., 5-3 considered favorable, $2\frac{1}{2}$-0 considered unfavorable), and horizontally at the point where the frequency of favorable responses was greater above the line, and unfavorable responses greater below the line. The responses in each of the four resulting quadrants were then tabulated in 2 x 2 contingency tables. The association between high scores (dependent on favorable responses to a majority of the items), and favorable responses to each item was submitted to the chi-squared test, corrected for continuity. Separate values were determined for the high school and university groups. On the basis of high values of chi-square in each group and item popularity, the original list of thirty items for each scale was reduced to twelve. The twelve items represented almost the full range of popularity exhibited by the original thirty items. The seventy-two items remaining in the six scales were again randomized to provide a second edition of the "Inventory of Choices".

The pilot study

The revised edition was administered to 325 high school students in college preparatory chemistry and physics classes. Again, the responses were scored, separately for each of the scales, and arranged into six tables. Persons were ranked in a vertical column with the highest scorer at the top and the lowest scorer at the bottom of the left hand column. The remaining columns were labelled in groups of six consecutively according to the numbers of the items in which each of the twelve statements of the scale appeared in the revised inventory. Crosses for each item appeared in each of twelve columns to indicate the response made by each student.

The matrix of responses was again dichotomized both horizontally and vertically. Chi-square was calculated for each of the 72 items and these varied from 12 to 125 with each association of high scale score with favorable response significant beyond the .001 level.

Each individual was re-scored, assigning the weights 1 to favorable and 0 to unfavorable responses. Proportions of individuals giving favorable responses to each item were calculated for each score from 0 to 12. All those individuals scoring 0 gave unfavorable responses to all twelve items, and all those scoring 12 gave favorable responses to all items, but the gradient between these extreme scores varied for each item, depending upon the popularity of the item. With popular items, the proportion of favorable responses climbed more rapidly than with unpopular items.

## Coefficient of reproducibility

According to Louis Guttman, when the items of a scale are arranged in order of popularity, responses to items can be predicted from scores. That is to say, a person scoring three on a twelve-point scale should respond favorably to the three most popular items. Unpredictable responses, such as favorable responses made by low-scoring individuals to unpopular items, are to be counted as "errors". The proportion of predictable responses expressed as a percentage is called the coefficient of reproducibility. Scales with a coefficient exceeding .90 are classed as efficient. Such scales are rank order scales only, for there is no indication that the distance between 3 and 4 is the same as that between 2 and 3. However, cut-off points can be manipulated to some extent in order to approximate regular gradations of item popularity.

The so-called "errors" are errors of prediction only and arise because of the heterogeneity of the scale items. An insistence upon a high coefficient of reproducibility prevents the attempted use of scales with more than one major dimension.

Combining items

The comparatively few errors to be expected with the use of improved scales can be further reduced by combining items of approximately equal popularity. This device is the Stouffer H-technique.[1] Suppose the original twelve items are combined for scoring purposes into three compound items, each compound item being thus made up of four of the original items. To achieve a favorable score on a compound item, an individual must give favorable responses to either three or four of the sub-items. A reduction is achieved in the chance of error caused by the idiosyncratic appeal that arises from the unavoidable complexity of the situation described in the item. The cost of the increased reproducibility is a decrease in the number of scale intervals. Those tested are assigned more surely to one of a smaller number of groups. When the responses of the 325 individuals were re-scored in this way, coefficients of reproducibility for the six scales were found to vary from .90 to .95.

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[1] Samuel A. Stouffer, Edgar F. Borgatta, David G. Hays, and Andrew F. Henry, "A Technique for Improving Cumulative Scales," Sociological Studies in Scale Analysis, ed. by Matilda White Riley, John W. Riley, Jr., and Jackson Toby (New Brunswick: Rutgers University Press, 1954), pp. 372-89.

Some tentative findings

Table 1 shows the difference between boys and girls in prudent vs. theoretic interests. Directions shown in this table are striking and reflect the well-known cultural definitions of masculinity and femininity in American society. The existence of these sex differences among students enrolled in science draws attention to the fact that college-bound students are usually required to take a laboratory science regardless of their intrinsic interest in the subject.

Table 2 demonstrates the heavily prudent orientation of the academic expectations that exists in the particular school. This finding was serendipitous and was one of the most interesting made in the pilot investigation. It also proved tantalizing, for in the replication study to be described later, the findings were not nearly so clear-cut. According to the data shown, those with prudent interests get higher grades, on the average, than those with theoretic interests; or, putting the case the other way, interests in how things work rather than in their social significance is a detriment rather than an asset in this particular school with respect to achievement.

Table 3 permits the effect of prudent vs. theoretic interests to be studied as it relates to broad classifications of subjects. Though the advantage is less than in the social studies and English, a prudent orientation is an asset in the competition for grades even in science and mathematics.

Practical educators have long maintained that intrinsic interest in a subject is associated with relatively higher achievement. Reports of studies of the relationships provide conflicting evidence. As part of the pilot investigation a study was designed to test the association between

## TABLE 1

### Difference Between Boys and Girls in Prudent vs. Theoretic Interests

| Scale Scores | Description of Interest | Boys | Girls |
|---|---|---|---|
| 3 | Highly prudent | 10% | 31% |
| 2 | Moderately prudent | 23 | 42 |
| 1 | Moderately theoretic | 36 | 18 |
| 0 | Highly theoretic | 31 | 9 |
| Number of cases | | 192 | 131 |

## TABLE 2

### Association Between Prudent vs. Theoretic Interests and Median Academic Grades

| Median academic grades | Scale Scores | | | |
|---|---|---|---|---|
| | Prudent | | Theoretic | |
| | 3 | 2 | 1 | 0 |
| High grades: A, B+, B | 80% | 63% | 52% | 42% |
| Low grades: B-, C, D | 20 | 37 | 48 | 58 |
| Number of cases | 61 | 99 | 92 | 71 |

## TABLE 3

### Influence of Prudent vs. Theoretic Interests upon Grades by Subject Area

| Median grade in subject area | Social studies and English | | Science and mathematics | |
|---|---|---|---|---|
| | Prudent | Theoretic | Prudent | Theoretic |
| A | 39% | 19% | 24% | 18% |
| B | 53 | 52 | 57 | 58 |
| C or D | 8 | 29 | 19 | 24 |
| Number of cases | 160 | 163 | 154 | 156 |

relative interest in natural science vis-a-vis interest in the humanities, and achievement in high school chemistry when several variables relevant to achievement are partialled out. Pre- and post-test scores using two forms of the Anderson Chemistry Test were used to measure chemistry achievement. The complex statistical analysis required has been fully reported.[1] Students with theoretic orientations showed approximately 20 per cent greater gain in achievement when corrections were made for regression toward the mean resulting from incomplete correlations between scores on pre- and post-test and variation in IQ.

Data from the pilot study also showed that girls tend to drop chemistry or physics in high school if their grades are poor. Table 4 shows that only 47 per cent of girls receiving C grades go on with a second science, whereas 80 per cent of the boys with C grades continue with a second course in science.

Table 5 shows that those with prudent interests do much better in social studies and English than they do in science and mathematics. The reverse is clearly true for those with theoretic interests. This relationship coupled with an equally clear relationship between expressed interest and vocational choice led to feelings of satisfaction with respect to the validity of the scales and their general usefulness for survey purposes.

The scales were now considered ready for use with a much larger and more representative population of San Francisco Bay Area high school students.

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[1] T. Bentley Edwards and Alan B. Wilson, "The Association Between Interest and Achievement in High School Chemistry," Educational and Psychological Measurement, XIX (Winter, 1959), 610-10.

### TABLE 4

### Influence of Grades Upon Attrition Rates of Science Students by Sex

| Disposition | Median Academic Grades | | | | | |
|---|---|---|---|---|---|---|
| | A | | B | | C | |
| | Boys | Girls | Boys | Girls | Boys | Girls |
| Continuing chemistry or physics | 100% | 86% | 91% | 78% | 80% | 47% |
| Taking other science | 0 | 2 | 2 | 14 | 11 | 33 |
| Taking no science | 0 | 12 | 7 | 8 | 9 | 20 |
| Number of cases | 36 | 51 | 116 | 103 | 66 | 15 |

### TABLE 5

### Influence of Prudent vs. Theoretic Interests on the Specialization of Achievement

| Area of Academic Superiority | Scale Scores | | | |
|---|---|---|---|---|
| | Prudent | | Theoretic | |
| | 3 | 2 | 1 | 0 |
| Science and Mathematics | 20% | 15% | 46% | 73% |
| Social studies and English | 80 | 85 | 54 | 27 |
| Number of cases | 25 | 41 | 37 | 26 |

Collection of information concerning such variables as home background, educational and vocational aspirations, school grades, IQ score, race, religion, favorite subject, and both in-school and out-of-school activities could provide data with which to test hypotheses concerning the association of these variables with scale scores.

## Bay Area High School Study

### The sample

A sample was sought so as to include a wide range of the attitudes, abilities, and aspirations under consideration. Data collection was made easier in at least two ways, first by choosing schools within easy driving distance of Berkeley, and second, by choosing schools willing, for one reason or another, to cooperate in the study.

Descriptions were written for each of the sixty-odd high schools within a fifty-mile radius of the University. These schools were divided into four major groups according as they were found in areas classed by the Bureau of the Census as: metropolitan, urbanized areas, cities over 5000 and places under 5000. In the first of these, three large metropolitan schools were selected more or less arbitrarily to include an all-Negro school (School #11 Table 6), School #3 with representation from several social classes, and the school (#13) used in the pilot study. A unique private school (#2) in the metropolitan area was also included. This school is heavily endowed and is practically tuition-free. According to the terms of the endowment, all those attending the school must take courses in the manual and industrial arts shops along with their academic courses.

Attempts were made to achieve a representative sample in the Negro high school and the heterogeneous school. In the pilot study school,

## TABLE 6

### Distribution of Fathers' Occupations

| Schools Number | Community Setting | Manual Labor | White Collar | Small Business & Merchants | Farm Owner | Professional | Executive |
|---|---|---|---|---|---|---|---|
| 1 | Town--rural marketing center | 42% | 20% | 19% | 6% | 7% | 1% |
| 2 | Metropolitan--boys' private school | 6 | 24 | 18 | 0 | 30 | 21 |
| 3 | Metropolitan--heterogeneous | 38 | 33 | 16 | 1 | 8 | 4 |
| 4 | City--light industry | 52 | 23 | 6 | 4 | 12 | 3 |
| 5 | Town--rural | 43 | 20 | 12 | 19 | 5 | 1 |
| 6 | Town--rural | 33 | 32 | 17 | 8 | 7 | 3 |
| 7 | City--industrial | 47 | 29 | 17 | 0 | 6 | 1 |
| 8 | Urban--working class residential | 55 | 32 | 11 | 0 | 1 | 1 |
| 9 | Sub-urban | 23 | 36 | 17 | 0 | 16 | 8 |
| 10 | Urban--industrial | 67 | 18 | 12 | 0 | 3 | 0 |
| 11 | Metropolitan--Negro residential | 74 | 14 | 6 | 0 | 6 | 0 |
| 12 | Urban--upper class residential | 2 | 19 | 19 | 0 | 25 | 35 |
| 13 | Metropolitan--"white collar" residential | 29 | 33 | 25 | 1 | 12 | 0 |
| All Schools Combined | | 40% | 27% | 16% | 3% | 9% | 5% |

almost the entire population of Grade 11 was tested, as was the entire population from the private school. The total number of students selected from each area was chosen so as to match as nearly as possible the proportions of the population of the State of California living in such areas.

Tables 7, 8, and 9 show the distributions of fathers' education, IQ scores of the students, and their racial origins. In schools #2, and #12, more than 75 per cent of the fathers are college graduates. Over half these fathers are in the professional and executive classes. For school #2 six per cent, and for school #12 two per cent of the fathers work with their hands. In each of these two schools one father in five operates a small business. None are farmers. In school #2, 31 per cent, and in school #12, 39 per cent of the children show IQ's in excess of 120. In school #2 only one child in a hundred shows an IQ of less than 100. In school #12, 13 per cent show an IQ of less than 100. School #2 is 97 per cent white; school #12 is 100 per cent white.

By way of contrast, 46 per cent and 37 per cent of the fathers in schools #5 and #7 did not attend high school. Between 40 per cent and 50 per cent of these fathers work with their hands. Nearly a third of the children in these schools show an IQ of 100 - 110. In school #5 96 per cent, and in school #7 86 per cent of the children are white. The first of these two schools is in a small town in the country; the second is in a small heavily industrialized town.

Schools #8 and #10 are in heavily industrialized communities within the metropolitan district. Fathers of children in #8 are nearly all in the working classes; 55 per cent work with their hands, 32 per cent are white collar workers, and 11 per cent own small businesses. Fathers of children in #10 show 67 per cent, 18 per cent, and 12 per cent in these three categories. Although 57 per cent and 60 per cent of these fathers graduated

## TABLE 7

### Distribution of Fathers' Education

| Fathers' education terminated during or at conclusion of: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | All Schools Combined |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Elementary school | 25% | 3% | 19% | 28% | 46% | 17% | 37% | 28% | 11% | 23% | 32% | 0% | 11% | 22% |
| High School | 51 | 18 | 49 | 48 | 35 | 53 | 49 | 57 | 42 | 60 | 40 | 20 | 45 | 45 |
| College | 19 | 44 | 21 | 13 | 13 | 17 | 9 | 9 | 34 | 8 | 16 | 50 | 31 | 21 |
| Post-graduate | 5 | 34 | 9 | 8 | 4 | 11 | 4 | 3 | 12 | 0 | 4 | 26 | 10 | 9 |
| Not available | 0 | 1 | 2 | 3 | 2 | 2 | 1 | 3 | 1 | 9 | 8 | 4 | 3 | 3 |

## TABLE 8

### Distribution of IQ Test Scores

| IQ Scores | School Number<br>1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | All Schools Combined |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 150 plus | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 0% |
| 140-149 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 2 | 2 | 1 |
| 130-139 | 1 | 6 | 3 | 2 | 1 | 3 | 1 | 1 | 2 | 0 | 0 | 10 | 6 | 2 |
| 120-129 | 6 | 24 | 12 | 3 | 3 | 4 | 7 | 4 | 7 | 9 | 1 | 26 | 11 | 8 |
| 110-119 | 21 | 43 | 20 | 15 | 17 | 15 | 23 | 12 | 16 | 9 | 8 | 27 | 24 | 18 |
| 100-109 | 27 | 25 | 22 | 9 | 38 | 21 | 31 | 16 | 22 | 28 | 22 | 16 | 21 | 20 |
| 90-99 | 23 | 1 | 15 | 10 | 21 | 15 | 21 | 14 | 16 | 23 | 24 | 11 | 12 | 15 |
| 80-89 | 12 | 0 | 14 | 3 | 5 | 12 | 6 | 7 | 5 | 23 | 25 | 2 | 7 | 9 |
| 70-79 | 5 | 0 | 7 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 17 | 0 | 2 | 4 |
| 60-69 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| below 60 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Not Available | 5 | 0 | 4 | 56 | 13 | 27 | 8 | 42 | 30 | 6 | 2 | 5 | 14 | 22 |
| Test | Mix | Otis | T-M | CMM | CMM-$_p$ | CMM | Otis | T-M | Otis | CMM | T-M | T-M | T-M | |

## TABLE 9

### Racial Distribution

| Race | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | All Schools Combined |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Negro | 0% | 1% | 29% | 1% | 0% | 1% | 10% | 1% | 0% | 22% | 91% | 0% | 7% | 13% |
| Oriental | 0 | 2 | 10 | 0 | 4 | 2 | 3 | 1 | 0 | 4 | 2 | 0 | 6 | 3 |
| White | 100 | 97 | 60 | 97 | 96 | 96 | 86 | 97 | 99 | 71 | 5 | 99 | 86 | 83 |
| Not Available | 0 | 0 | 1 | 2 | 0 | 1 | 1 | 1 | 1 | 3 | 2 | 1 | 1 | 1 |
| Number of Cases | 388 | 160 | 380 | 227 | 135 | 141 | 222 | 538 | 288 | 123 | 311 | 96 | 601 | 3750 |

from high school, only 12 per cent and 8 per cent are reported as college graduates. Only 60 per cent of the IQ's from school #8 were available, but these show a fairly normal distribution. Those from school #10 however, show 23 per cent from 90-99 and 23 per cent from 80-89. In school #8, 97 per cent of the children are white. In school #10, 71 per cent are white.

In one other school, #11, 91 per cent of the children are Negroes. Only one child per hundred, in this school, shows an IQ over 120, and less than ten per cent show IQ's in excess of 110. Three-quarters of the children show IQ's ranging from 80-109, and 17 per cent show IQ's of 70-79. Fathers of 40 per cent of these children are reported as having graduated from high school, and 20 per cent are reported as college graduates. Many of the children are sons and daughters of workers attracted from the south during World War II. None of these fathers is an executive, but 6 per cent are reported as being in the professional class. Three-quarters of the fathers are manual workers.

Collection of the data

Information called for in the booklets distributed to the 3750 children was pre-coded as far as possible. Reference to the questionnaire itself in Appendix B will show that pre-coding was easily accomplished with the 72 items of the inventory, but that labor-saving improvements are possible with some of the other parts of the questionnaire. Six additional items were added to test student opinion regarding labor, business, government, schools, and the freedom of the press.

All questionnaires were administered by the same member of the research team, and additional information was collected from the extant records of the schools. All school officials were unfailingly courteous and helpful, and only one parent raised serious objections. His child's paper was returned and the information it contained was not used. Nine other papers were facetiously answered, 26 were incomplete, and three had been miscollated. But all of the other thousands of papers seemed usable.

Collection of the additional data from extant records was monotonous, exacting, and time-consuming. In some of the schools the information was much more readily available than in others. The difficulty that was encountered by the researchers is also encountered by the teachers in these schools and points to the need for up-to-date equipment which would enable the teacher to press a button in order to obtain needed information about pupils or groups of pupils.

Coding and recording the data

Once the ten big cartons of questionnaires and the hundreds of sheets of additional information were in the office, coding of uncoded information was initiated along with preparation of data sheets from which the punching of IBM cards could be operated. Code books were used to keep track of the information and to ensure precise translation of the prepared cards. Several decks of cards were planned so as to facilitate the numerous comparisons that were envisaged. Each card holds twelve rows and eighty columns. Multiple punching was to be avoided wherever possible.

A four digit identification number was assigned to each questionnaire, and this number was written on the cover page and on pages one, eight, and twelve. Other code numbers were assigned unequivocally in nearly all cases. Such objectivity was sometimes achieved with difficulty especially with such items as occupation of father, occupational aspirations of student, the orientations of these occupations, and the orientations of school activities.

In these cases, the two chief investigators discussed the various possibilities, worked out a skeleton plan, then proceeded to code several hundred of these difficult items. Doubtful assignments were discussed as they were encountered, and then batches of questionnaires were exchanged. This time numerous differences of opinion again occurred, the differences were compromised, and the lists shown were eventually adopted. Questionable assignments still appear in a few cases, but where a difference of opinion could not be resolved, the datum was rejected in the interest of purity of the category.

With all of the information from the Bay Area High School Study transferred to one or more IBM cards, re-establishment of the scales with the aid of machine sorting became possible as well as the processing of the data into a large number of tables.

## Data-processing

Detailed directions for data-processing were written. The varieties of information obtained by following these directions will be summarized. The first four columns of each deck was used for the identification number of the paper, and the fifth column to identify the deck.

## Deck one

Columns 6-77 (inclusive) of deck one were used to record responses to items in each of the six scales. Columns 78-80 (inclusive) were reserved to record the prudent-aesthetic, theoretic-aesthetic, and immediate-aesthetic scores, once these scores had been processed.

## Deck two

Columns 58-69 (inclusive) of deck two were used to record prudent-theoretic scale item responses. These were simply transferred from the appropriate columns of deck one. Columns 6-57 (inclusive) of deck two were used to record the personal and familial characteristics obtained by information reported on pages 8-12 (inclusive) of the questionnaire. Deck two could thus be used to compute cumulative frequencies and cumulative percentages for each item of the prudent-theoretic scale and for each school. On the basis of the cumulative percentages and having regard for the manner in which the scales were established in the pilot study, cutting points were decided upon and items of approximately equivalent popularity combined so as to produce a scale of three compound items. Successive dichotomization of the cards according to responses on the sub-items made possible the tabulation of the various response patterns. By assigning these patterns into scale and non-scale varieties, error counts were made and coefficients of reproducibility were calculated. When response patterns to the remaining five scales were available, columns 70-75 (inclusive) were used to record these patterns. Deck two could thus be used to run tables associating response patterns to each scale, or responses to individual items of the prudent-theoretic scale, with the personal and familial characteristics recorded elsewhere on the same card. Because of the manner in which scale scores were coded, deck two can be used to extract large quantities of information.

## Deck three

This deck was used to derive the scale scores and response patterns for the theoretic-immediate, and prudent-immediate scales. Columns 32-80 (inclusive) are thus available on this deck of cards for the transfer of information that can be expected to associate with responses to individual items of these two scales.

Deck four

This deck contains the prudent-aesthetic, the aesthetic-immediate, and the theoretic-aesthetic responses in columns 6-41 (inclusive) and column 60. Additional information such as educational and vocational aspirations has been coded into columns 42-80. With this deck, associations between single-item responses on the three aesthetic scales and information concerning all other variables can be determined.

The four decks of cards have been used to run literally hundreds of tables and these tables provide the basic information upon which the discussion in the body of the text is based.

Much of the description, to this point, is of research conducted under USOE contract # SAE 7143. A knowledge of the development of this research is essential to an understanding of research performed under USOE contract # 7787, covering the period from July 1, 1958, to June 30, 1961. Further, much of the treatment of data of the Bay Area High School Study was performed since July 1, 1958.

The early success of the High School Study prompted the writing of a proposal for research concerning the attitudinal orientations of children in the elementary school and the relationships of these orientations to such measurable variables as educational and vocational aspirations, success in school, climate of opinion in school attended, class sociometry, occupation of father, IQ, age, sex, etc.

The United States Office of Education graciously provided funds for a fresh project, this one to last for three years.

## The Elementary School Study

### Choice of an instrument

Early in the fall of 1958, work commenced on a revision of the high school inventory that could be expected to provide consistent and reliable expressions of opinion from children in the elementary grades. The first step taken was to simplify the language of the high school items, leaving the ideas as nearly intact as possible. This Form A of the experimental elementary inventory is reproduced in Appendix B. Essentially, the two poles are extracted from the matrix of the item, and pupils are asked to check their preferences. With a second check they are asked to indicate the strength or intensity of their preferences.

For example, the first item of the high school inventory is:

> I am more interested in finding out how TV has affected people's taste than in finding out how TV works.
>
> 1. strongly agree
> 2. moderately agree
> 3. slightly agree
> 4. slightly disagree
> 5. moderately disagree
> 6. strongly disagree

In Form A of the elementary school inventory, this item becomes:

> If we were going to study about television in school
>
> _________ I'd like to find out how TV sets are made and how they work.
>
> _________ I'd like to find out how watching TV affects people.
>
> _____ strongly _____ somewhat _____ slightly

Preparation of this form suggested a means whereby a set of broad possibilities could be considered as a basis for action that is immediate, aesthetic, prudent or theoretic. Preferences from among these proposals for action could be elicited quite simply by asking the children to make the six pairs of comparisons that are possible among the four alternatives. This device makes it possible to check the stability of the poles in different scales.

Form B, reproduced in Appendix B, was accordingly devised. The form is illustrated here with the following item:

On a rainy day recess at school I'd rather

____ draw or paint.
____ play chess.
____ much ____ somewhat ____ slightly

____ play chess.
____ talk with friends.
____ much ____ somewhat ____ slightly

____ talk with friends.
____ draw or paint.
____ much ____ somewhat ____ slightly

____ discuss class problems.
____ draw or paint.
____ much ____ somewhat ____ slightly

____ discuss class problems.
____ draw or paint.
____ much ____ somewhat ____ slightly

____ discuss class problems.
____ talk with friends.
____ much ____ somewhat ____ slightly

Form B is obviously sensitive to illogical responses, and to provide some possibility of item selection, additional items were included.

Form A of the inventory of 72 items was administered to 53 pupils in two high-third grade classes of the Berkeley elementary schools and to 67 pupils in two high sixth-grade classes.

Form B of the inventory consisting of fourteen groups of six comparisons was given to 60 in grade three and 64 in grade six.

Class, grade, form, and responses to each item were punched on IBM cards. Incomplete and undecipherable documents were omitted, though there were few of these. With Form A, the scoring was performed with the aid of an elaborate key in which the seven different categories of responses were appropriately numbered. With Form B, "slightly" was alternately 5 or 3 depending on the positive or negative wording of the alternative, leaving the score of 4 to be assigned in those few cases where the respondent refused to make up his mind.

Treatment of the responses to Form A was much the same as that described for the responses by the high school students. For each of the six scales, the items were combined into three groups such that approximately 30 per cent, 55 per cent, and 80 per cent, gave favorable responses.

With Form B a special procedure for item selection was needed since each of the fourteen items contained sub-items from each of the six scales.

For each of the sub-items, the number of "errors" was calculated. To calculate the number of "errors", the items were arranged into three groups each as internally homogeneous as possible. The marginal cutting points of the sub-items varied somewhat, but the averages of favorable responses were held reasonably close to 30 per cent for compound item A, 55 per cent for B, and 80 per cent for C.

A matrix of contingency tables of each sub-item with every other sub-item was then prepared with the least popular favorable items in the upper left hand corner and the most popular favorable items in the upper right and lower left hand corners. Each contingency table contained four cells, favorable to both responses in the upper left, and unfavorable to both responses in the lower right. No sub-item was compared with itself and the duplicating section of the matrix below the diagonal was, of course, omitted.

For comparisons between sub-items of different compound items, only frequencies in the upper right hand cell are "errors" (favorable to a less popular item and unfavorable to a more popular item). Where the sub-items are compared with others in the same compound item, any variation in response is an "error".

The various sub-items were then tabulated in rank order according to number of "errors". Using Table 10 as an illustration, we see that by this means item number two, though useful as a sub-item of the aesthetic-immediate scale is one of the least useful in the other five scales. Item two was therefore the first to go.

After re-scoring with thirteen sub-items, the rank-order according to number of "errors" was changed. On the new basis, item three was eliminated. By successive re-scoring and re-calculation of the number of "errors", items 1, 14, and 5 were successively eliminated.

Calculation of the coefficients of reproducibility was based on the information provided in Table 11. Form B has a slight edge with an average C of R of .93 as opposed to .92 for Form A. Because of this and also because the content of Form B tends to be more clear cut, the decision was reached to use Form B.

The elementary school sample

For a number of reasons, we decided to obtain our elementary school sample from the Berkeley Unified School District. As will be demonstrated later, the inhabitants of Berkeley present a broad spectrum of socio-economic conditions. Furthermore, the classes are fairly closely linked to topography. In the hills, professionals and executives predominate. Most of those who live on the flats are manual workers and artisans. In between, both socially and geographically, are the foothills.

## TABLE 10

Rank Order of Reductions

| Item | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **First Trial** | | | | | | | | | | | | | | |
| Scale | | | | | | | | | | | | | | |
| P-T | 5 | 14 | 13 | 8 | 6.5 | 6.5 | 10 | 1 | 4 | 2 | 12 | 3 | 9 | 11 |
| P-I | 9 | 12 | 5 | 13 | 11 | 2 | 6 | 7 | 1 | 3 | 8 | 4 | 10 | 14 |
| P-A | 4 | 12 | 9.5 | 9.5 | 13 | 1 | 3 | 2 | 5 | 11 | 6 | 8 | 14 | 7 |
| T-I | 12 | 14 | 13 | 6 | 11 | 3.5 | 8.5 | 2 | 8.5 | 1 | 5 | 3.5 | 10 | 7 |
| T-A | 13 | 11 | 12 | 4 | 2 | 8 | 7 | 3 | 5 | 10 | 9 | 14 | 1 | 6 |
| A-I | 11 | 4 | 6 | 13 | 2 | 1 | 8 | 10 | 5 | 12 | 7 | 9 | 3 | 14 |
| Total | 54 | 67 | 58.5 | 53.5 | 45.5 | 22 | 42.5 | 25 | 28.5 | 39 | 47 | 41.5 | 47 | 59 |
| **Second Trial** | | | | | | | | | | | | | | |
| P-T | 6 | -- | 13 | 7 | 5 | 8 | 11 | 1 | 4 | 2 | 12 | 3 | 9 | 10 |
| P-I | 9 | -- | 7 | 12 | 11 | 4 | 6 | 5 | 1 | 3 | 8 | 2 | 10 | 13 |
| P-A | 2 | -- | 10 | 6 | 12 | 5 | 3 | 1 | 4 | 11 | 7 | 9 | 13 | 8 |
| T-I | 12 | -- | 13 | 6 | 10 | 4 | 11 | 3 | 8 | 1 | 2 | 5 | 9 | 7 |
| T-A | 12 | -- | 11 | 5 | 4 | 8 | 7 | 2 | 2 | 10 | 9 | 13 | 2 | 6 |
| A-I | 11 | -- | 6 | 12 | 2 | 1 | 7.5 | 9 | 3 | 10 | 4 | 7.5 | 5 | 13 |
| Total | 52 | -- | 60 | 48 | 44 | 30 | 45.5 | 21 | 22 | 37 | 42 | 39.5 | 48 | 57 |

TABLE 11

Form A

| Scale | P-T | | | P-I | | | P-A | | | T-I | | | T-A | | | A-I | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grade | 3 | 6 | T | 3 | 6 | T | 3 | 6 | T | 3 | 6 | T | 3 | 6 | T | 3 | 6 | T | |
| 3 + + + 1 | 7 | 14 | 21 | 7 | 8 | 15 | 11 | 10 | 21 | 8 | 10 | 18 | 6 | 15 | 21 | 10 | 5 | 15 | |
| 2 - + + 2 | 21 | 19 | 40 | 17 | 26 | 43 | 6 | 35 | 41 | 19 | 26 | 45 | 18 | 26 | 44 | 19 | 22 | 41 | |
| + - + 3 | 3 | 1 | 4 | 5 | 3 | 8 | 4 | 3 | 7 | 5 | 1 | 6 | 8 | 2 | 10 | 6 | 2 | 8 | |
| + + - 4 | 3 | 1 | 4 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 3 | 4 | |
| 1 - - + 5 | 11 | 17 | 28 | 15 | 22 | 37 | 21 | 11 | 32 | 10 | 20 | 30 | 13 | 16 | 29 | 9 | 26 | 35 | |
| - + - 6 | 1 | 2 | 3 | 0 | 2 | 2 | 2 | 2 | 4 | 2 | 3 | 5 | 1 | 3 | 4 | 1 | 3 | 4 | |
| + - - 7 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 1 | |
| 0 - - - 8 | 2 | 10 | 12 | 4 | 2 | 6 | 3 | 3 | 6 | 2 | 3 | 5 | 2 | 1 | 3 | 1 | 3 | 4 | |
| Total | 48 | 64 | 112 | 48 | 64 | 112 | 48 | 64 | 112 | 48 | 64 | 112 | 48 | 64 | 112 | 48 | 64 | 112 | |
| C of R | 7<br>.90 | 4<br>.96 | 11<br>.93 | 5<br>.93 | 6<br>.94 | 11<br>.93 | 7<br>.90 | 5<br>.95 | 12<br>.93 | 9<br>.88 | 5<br>.95 | 14<br>.92 | 9<br>.88 | 6<br>.94 | 15<br>.91 | 9<br>.88 | 8<br>.92 | 17<br>.90 | Average .92 |

| Scale | P-T | | | P-I | | | P-A | | | T-I | | | T-A | | | A-I | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grade | 3 | 6 | T | 3 | 6 | T | 3 | 6 | T | 3 | 6 | T | 3 | 6 | T | 3 | 6 | T | |
| 3 + + + 1 | 13 | 7 | 20 | 10 | 9 | 19 | 7 | 4 | 11 | 3 | 22 | 25 | 7 | 8 | 15 | 5 | 7 | 12 | |
| 2 - + + 2 | 13 | 20 | 33 | 11 | 28 | 39 | 24 | 26 | 50 | 18 | 18 | 36 | 24 | 30 | 54 | 22 | 31 | 53 | |
| + - + 3 | 3 | 0 | 3 | 6 | 3 | 9 | 1 | 3 | 4 | 3 | 0 | 3 | 0 | 2 | 2 | 5 | 4 | 9 | |
| + + - 4 | 0 | 1 | 1 | 0 | 2 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 1 - - + 5 | 15 | 18 | 33 | 16 | 12 | 28 | 17 | 21 | 38 | 13 | 13 | 26 | 10 | 21 | 31 | 14 | 16 | 30 | |
| - + - 6 | 2 | 1 | 3 | 6 | 4 | 10 | 0 | 2 | 2 | 3 | 1 | 4 | 6 | 0 | 6 | 4 | 2 | 6 | |
| + - - 7 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | |
| 0 - - - 8 | 6 | 14 | 20 | 3 | 4 | 7 | 2 | 4 | 6 | 11 | 7 | 18 | 5 | 0 | 5 | 1 | 2 | 3 | |
| Total | 52 | 62 | 114 | 52 | 62 | 114 | 52 | 62 | 114 | 52 | 62 | 114 | 52 | 62 | 114 | 52 | 62 | 114 | |
| C of R | 5<br>.94 | 3<br>.97 | 8<br>.95 | 12<br>.85 | 9<br>.90 | 21<br>.88 | 2<br>.97 | 7<br>.92 | 9<br>.95 | 7<br>.91 | 2<br>.98 | 9<br>.95 | 6<br>.92 | 3<br>.97 | 9<br>.95 | 10<br>.87 | 6<br>.94 | 16<br>.91 | Average .93 |

There are fourteen elementary schools in Berkeley and categorization of these fourteen into three distinct social groupings is reasonably definite.

By superimposing both the boundaries of the elementary school attendance districts and the United States census tract boundaries upon a detailed map of Berkeley, the proportions of the population of each census district can be estimated. Using these proportions as factors to translate census-tract data into school-district data, the attributes of the school district populations (as they were a decade ago, in 1950) were ascertained.

In Table 12 we see that two-thirds of the employed males in the Flats are manual workers whereas only one-fifth in the Hills area are engaged in manual work. Similarly, while well over a half in the Hills are professionals, managers, and kindred workers, less than one-fifth in the Flats hold comparable positions. While there is some variation between the individual school districts within each of the three broad strata--e.g., Cragmont district having the highest concentration of high-status occupations in the Hills--the largest and most significant differences are between the strata: Hills, Foothills, and Flats. This ready categorization of a broad social spectrum provides a most important first reason for selecting the elementary school group from the Berkeley Unified Schools.

A second reason for choosing Berkeley is that the University of California with its School of Education is also in Berkeley. With a three-year study envisaged, and with plans laid for a panel investigation to cover more than a decade, propinquity grows increasingly significant.

Further, relations between the Berkeley Unified Schools and the School of Education are extremely cordial. Because of the need to enter classrooms

## TABLE 12

### Percentage Distribution of Employed Males in Major Occupational Groups, According to School Districts and Strata: Berkeley, 1950[a]

| School district<br>Stratum | Number of employed males reporting | Occupational groups[b] | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| Cragmont | 1864 | 45% | 24% | 18% | 5% | 7% |
| Hillside | 2435 | 39 | 12 | 21 | 7 | 21 |
| John Muir | 1233 | 35 | 26 | 22 | 6 | 11 |
| Thousand Oaks | 1590 | 34 | 24 | 22 | 11 | 9 |
| Oxford | 1079 | 37 | 19 | 23 | 9 | 12 |
| Emerson | 2223 | 35 | 15 | 23 | 7 | 19 |
| Hills | 10424 | 38 | 19 | 21 | 7 | 14 |
| Whittier-University | 1645 | 27 | 15 | 21 | 15 | 21 |
| Le Conte | 2912 | 28 | 13 | 22 | 14 | 24 |
| Jefferson | 2158 | 19 | 18 | 20 | 20 | 23 |
| Washington | 2473 | 19 | 13 | 19 | 21 | 27 |
| Foothills | 9186 | 23 | 15 | 21 | 17 | 24 |
| Franklin | 3295 | 11 | 12 | 16 | 20 | 41 |
| Longfellow | 2559 | 8 | 8 | 14 | 21 | 49 |
| Lincoln | 2250 | 7 | 6 | 14 | 17 | 56 |
| Columbus | 1603 | 9 | 11 | 14 | 26 | 40 |
| Flats | 9706 | 9 | 9 | 15 | 21 | 47 |

[a] Calculated from *U.S. Census of Population: 1950*. *loc. cit.*, Vol. III: *Census Tract Statistics*, chap. xlix, 45-48.

[b] Occupational categories, as defined in the census, were combined in this table into the following groups:

1. Professional, technical, and kindred.
2. Managers, officials, and proprietors (including farm).
3. Clerical and sales.
4. Craftsmen and foremen.
5. Operatives, private household workers, service workers, laborers, and farm laborers.

and to ask the pupils fairly intimate personal questions, a disposition on the part of the school authorities toward whole-hearted cooperation can be most helpful.

Finally, school authorities in Berkeley conduct an extensive testing program and the results of these tests are uniformly and accurately recorded. Many of the data used in the present investigation were obtained simply by going to the schools and copying data from extant records.

A stratified random sample of ten high-third grade classes was drawn, with probability proportionate to size, and all 26 classes of the high-sixth grade were included. By including all children in a given class, testing was made easier. Teachers are much more reluctant to excuse from one-third to one-half of their pupils than they are to give up the entire class for a lesson period. By including all the children in a given class it was also possible for a member of the research team to administer all of the inventories.

Choice of third and sixth grades provided as wide a variation of pupil maturity as possible, for children below third grade cannot make the needed choices consistently enough to provide useful data, and children above sixth grade are in the junior high school. These two grades provided a total of nearly 1200 pupils, a number in line with the resources of the project.

## Collection of the data

All inventories were administered by Wilson. When collecting responses from the third grade, he read all of the statements aloud, and the pupils checked the appropriate blank spaces. The inventory is reproduced complete in Appendix B, and shows that information concerning parents' occupation and schooling was collected at the same time. Respondents also indicated preferences among school subjects, educational aspirations, daily activities, liking for school, race, religion, and vocational aspirations.

The data which were collected from the permanent school records for each child, and subsequently coded and punched on to cards were:

1. Name
2. Sex
3. Birthdate
4. Test scores
    a. California Mental Maturity Test
        (1) Intelligence quotient
        (2) Mental age
        (3) Language (verbal) sub-score
        (4) Non-language sub-score
    b. California Reading Achievement Test
    c. California Arithmetic Achievement Test
5. Birthplaces
    a. Pupil
    b. Father
    c. Mother
6. Language spoken at home
7. Father's occupation
8. Mother's occupation

The IQ tests had been administered the prior year, in 1957-1958, while the pupils were in the fifth grade. The arithmetic and reading achievement tests were administered by the teachers during the year when the data were collected. These test scores were not available for all of the students.

For the 405 high-sixth grade boys, for example, 327 IQ scores, 387 reading scores, and 377 arithmetic scores were available. Similar fractions of the data were available for other groups. In part the loss of data derived from: absences of pupils during the testing program; errors in either scoring or in transcription which became evident through cross-tabulations of chronological age, mental age, and intelligence quotient; and recent transfers of pupils into the district.

From the teachers' reports to the parents in April of 1959, the grade level of the reader to which the children were assigned at that time was determined, and also the teachers' indications of their children's interest in school: "Shows interest in school--usually, often, rarely."

The teachers were given a mimeographed class list, and asked to check the names of the students whom they considered outstanding--to whom they would assign A or B grades were they to give conventional letter grades (short descriptions and parent-teacher conferences are the practice in the Berkeley elementary schools)--in the following subjects: reading, social studies, arithmetic, and science.

Sociometric inventories, consisting of a class list with three squares after each name, was administered to each of the 36 classes in the elementary sample. A facsimile of the inventory without names appears in Appendix B.

The pupils were asked to check the names of their classmates as follows:

1. "...Put a check in the first square on the line after the names of all of the children that you think of as being your good friends--children with whom you often talk and play--at recess, perhaps, or after school, or on the week-end. You may check as many or as few as you wish."

2. "Now suppose that you had some problem that was worrying you. Who are the few children you would be most likely to talk it over with? Put a check in the second square--in column two--on the line after the names of not more than three children whom you would look to for help."

3. "Who is your best friend in the class? In column three check the name of one person who is your best friend in the class."

Only the responses in the first column, allowing an unlimited number of associates within the class, were used in the sociometric analysis.

On the right side of this sheet were four additional questions. In questions 82 and 83 the pupils were asked to indicate how they thought their best friends (whom they had identified in the third column of the sociometric inventory) had answered the questionnaire items on liking for school and on post-high school intentions. Question 84 was: "What do you think your parents would say if they were asked, 'How much school do most young men need nowadays--some high school? finish high school? some college or junior college? or graduate from a four-year college or university?'" On the lines after item number 85, the pupils were asked to write their occupational expectations (as distinguished from the aspirations, which they had indicated on item 81 of the questionnaire. Unfortunately a recess was called at one school just as the children were approaching this last question, so they were released, and the data are incomplete.)

Brief one-page mail questionnaires were sent to the parents of the sixth grade pupils. These were addressed to the fathers, where fathers were indicated on the class rosters. One follow-up mailing was sent two weeks after the initial mailing to those parents whose responses were not yet returned.

Eighty-seven per cent of the parents who were contacted sent in responses. The frequency distribution of returns filled out by various relations showed 534 filled out by fathers, 131 by mothers, and 42 by others. One of the 102 non-respondents returned his questionnaire--properly filled out--a full year after it had been sent out, without any further solicitation. Unfortunately, the polls had closed.

The only items from this questionnaire which were used, aside from the very valuable unsolicited free comments of a number of the parents, were item 2, concerning the parents' recommendation for formal schooling, and 5, the fathers' occupations. It had been hoped that item 2 and the four subsections under item 4 might form a short scale reflecting attitudes by the parents toward formal schooling. The items were not pre-tested and while they were moderately intercorrelated, they proved to have virtually identical distributions and therefore could not form a scale.

Three sources were thus made available to determine fathers' occupations: the permanent records (which were not always revised after the child's first registration in the school), pupils' reports on their questionnaires, and the responses of the parents. While each of these sources was coded and punched, a "best estimate" was made by taking the parents' responses (for the fathers' occupations) where available, and, where not available from this source, adding the information from the other two sources, providing that they were not incompatible with each other. The coding of occupational titles and descriptions is indicated in Appendix B.

### The British Study

In survey research of the kind being described, especially where the bulk of the comparisons are made internally, collection of data from a foreign sample can be expected to prove interesting. Either the associations demonstrated among the data taken from the domestic sample will be replicated, thereby broadening the scope of the generalizations; or else the associations will not appear, and known differences between the populations can be studied in order to provide explanations. Such attempted explanations may lead to increased insights concerning the variables that are being investigated.

## Eleven plus examinations

School children in England are separated at the age of eleven plus by means of an examination into virtually two streams. The successful minority goes to the college-preparatory grammar schools; the majority, to the secondary modern schools. Attitudes which develop in the two sharply distinct groups may be expected to differ.

Both the educational and the vocational aspirations of the secondary modern school pupils are sharply curtailed. Grammar school teachers are usually university graduates; secondary modern teachers seldom are. Family origins of the two groups may, on the average, be expected to show sharp distinctions. Certainly, the intelligence of the two groups may be expected to differ, for it is largely on the basis of intelligence testing that the selection is made.

Data were collected from a British sample during the fall semester of 1959.

## Modification of the instrument

British visitors to America are reasonably common. A cursory search revealed the presence of two girls, recent arrivals from England, among the students of a neighboring school. These two went over the high school inventory with great care and explained certain minor changes in the language that would otherwise puzzle British children. When the researcher conducting the study arrived in England, he went over the questionnaire (now pronounced as if it began with the letter "k" rather than with the combination "kw") with one or two British educators, and a few additional changes were made. Twelve hundred copies of the revised inventory were ordered. These were prepared promptly, accurately, and at a reasonable cost. A copy of the revised inventory appears in the Appendix B.

## Selection of the sample

Before school opened in the Autumn, steps were taken to secure an appropriate sample. Partly through the investigator's lack of familiarity with British educational organization, both formal and informal, and partly because educational research is far less common in England than in America, these steps turned out to be numerous, repetitive, and difficult. An interview with one of Her Majesty's Inspectors of Schools proved easy to arrange and the inspector in his pleasant office just off Berkeley Square was most cordial as well as genuinely interested in the research. However, he was soon compelled to say that despite a national system of education, the authority regarding entry into a given school is almost completely local and that he could not possibly give permission to collect data. At the same time, he made it clear that Her Majesty's Government saw nothing wrong with what was proposed. He suggested a visit to the County Offices of Education for London and for Middlesex, both of them situated conveniently near the Houses of Parliament.

Interviews were therefore arranged with representatives of the Education Officers of the two counties. These representatives asked a great many questions, were very polite, and promised to give the request further attention. One county office made a flat refusal a month or so later. The other office provided the researcher with a complete list of schools that would probably cooperate. This list reached the researcher the day before he left for home some three months later.

In the meantime, action of a different kind was clearly indicated.

The University of London, situated in Bloomsbury, has an extensive Institute of Education that is not entirely unlike a School or Department of Education in an American university. The Director of this Institute responded warmly and affably to the problem of the researcher and directed him to conferences with two or three regular faculty members. By far the most helpful of these with respect to obtaining a sample was Doctor C. M. Fleming, herself a well-known and highly respected researcher in educational sociology. She was able to supply three names, one of a researcher in the Surrey Office of Education, one an Inspector in the County Borough of Stratford, and one a headmaster of an Essex grammar school.

With the splendid assistance of these three, access to a reasonably well-diversified population of both secondary modern and grammar school children was provided. Although the population obtained was not representative of the London area, it demonstrated a wide range with respect to a number of the variables being investigated.

## The sample

Two boys' county grammar schools supplied 428 students. Of these 35 were in the fourth form, 131 in the fifth, and 262 in the sixth.

Because students normally spend two years in each of these three forms, attendance at a grammar school for six years is fairly common. The few preparing for the University may come back after writing the Ordinary Level of the General Certificate of Education in the lower sixth at age sixteen to spend two or even three years in the upper sixth. This period is one of specialization in two or three subjects in preparation for the Advanced Level of the GCE. Success in this examination means entrance to one of the better universities with financial assistance if it is needed.

A girls' county grammar school supplied 90 students, all of them in the fourth form.

Four secondary modern schools supplied 286 students--150 boys and 136 girls. Of these, 54 boys and 51 girls were in the fourth form; 96 boys and 85 girls were in the third form. These four schools are all in the dock section of East London. Few children stay on at the secondary modern schools after the compulsory leaving age of fifteen has been reached.

One secondary modern school in Surrey supplied 10 boys and 17 girls, all of them in the upper fourth form. This special class was being groomed by the teachers and the headmaster for the ordinary level of the GCE examination. Access was obtained to copies of the reports to parents. On each of these reports, the classroom teacher and the headmaster had both written praise or admonition depending on the marks currently obtained in the teachers' examinations. No doubt these were the best scholars in the school, and carried the hopes of the faculty regarding academic achievement. Had this group of students managed to pass the examination for entrance into the grammar school, they would not have received much attention. In fact, most of them would probably have been written off by the grammar school teachers as rather unlikely to succeed.

The remaining 63 students in the sample, 28 boys and 35 girls, came from the fourth and fifth forms of a technical school in the County of Essex. Those children who are successful in the eleven plus examination sometimes have the choice of going to either a grammar school or to a technical school. Except for slightly heavier enrollments in the courses in metal shop, wood shop, and home economics, the program and constitution of the technical school seems indistinguishable from that of the grammar school. Manchester Grammar School has a heavier program in both industrial arts and fine arts than has the technical school from which data were selected. Unlike most grammar schools, which are for either boys or girls but not for both, the technical school included in the sample is coeducational. Incidentally, this is a comparatively new school and the buildings were quite the best seen in England. Complete with library, gymnasium, shops, and well-lighted classrooms, the buildings of this technical school would do credit to any community in California.

## Collection of the data

The headmaster of an English Public School is almost completely autonomous. True, each school has a governing board, but these usually exercise their prerogative of selecting a headmaster, not of directing him after he has been selected. The hand of the Ministry of Education is light. The alumni, especially where the headmaster has been long in office, are almost as readily controlled as when they were in school.

Intellectual though he may be, the English headmaster does not scorn the techniques of control. He has a comfortable private office, with a fireplace, and the door is usually closed. He is seen in public often enough to be recognizable, but never enough to become familiar. He chooses his own staff, and except for certain areas which tradition has defined with the utmost clarity, he directs their activities. His is the last word respecting teaching assignments, disciplining of students, and dealing with parents. Because his school is exceedingly difficult to enter, but rather easy to exit, his advantage in dealing with parents is readily imagined.

Much of this glorification of the "head" has been transferred to the man in charge of a grammar school and some of it to the "head" of a secondary modern. Although the inspector previously referred to was particularly helpful in obtaining data from four of the secondary modern schools, it was necessary at each school to obtain direct permission from the headmaster after first making an appointment to see him.

Each headmaster, in the end, was extremely helpful. Schedules were arranged with the least possible difficulty so that the visiting researcher was able to administer all of the inventories himself. Sometimes the teacher remained in the classroom but usually he did not.

Several subjective impressions seem to be in order. On the whole, the English children proved easy to manage. At one time, the inventory was administered at one time to 63 boys and girls seated in the school cafeteria. No teacher was present, but there was not a sound except for the occasional quiet turning of a page. However, one set of boys, unknown to the researcher, were deprived of their period of physical education in order to write their responses. Their resentment at the substitution of a school task for a period of almost unrestrained activity was thinly veiled, and there were moments when the appropriate classroom climate for answering the inventory was difficult to maintain.

In the grammar school which supplied the largest number of respondents, the prefects were most helpful. These are boys who are in the upper sixth and upon whom the headmaster depends for much assistance in the operation of the school. These young men have most of their time at their own disposal. They are probably "reading" under the guidance of a tutor for advanced level GCE examinations in two or three subjects; they have a common room which is practically sacrosanct, even to the teachers; and they shoulder most of the burden of the organization of "activities" and of discipline in halls and playground that takes not a little of the time and energy of American high school teachers. The headmaster selects a captain of the school from among the prefects, and this captain is a very important young man indeed. When the researcher left, he and the "captain" exchanged letters expressing mutual satisfaction concerning the collection of data in this school.

Many of the children from the secondary modern school who responded satisfactorily to the inventory of choices were in the third form. In this form, the modal age is thirteen. American children normally spend their thirteenth year in the 8th grade. Attempts to use the high school inventory below the tenth grade in the Bay Area High School Study were not generally successful. Either the British children are reading better than American children, they are better able to understand the choices presented, or else they took the questionnaire items more seriously. In the opinion of the researcher, the first possibility is the most likely.

Because, in most English schools, the class is the unit for scheduling purposes rather than the individual student, collection of data from extant records was relatively simple with respect to data deemed important by the school. However, other data, for example the Moray House scores of pupils entering grammar school, were sometimes impossible to track down. At least one case was encountered where the headmaster had destroyed the data.

On the other hand, the National Foundation for Educational Research, with offices in Wimpole Street, was conducting research on students at the technical school included in the present study. A profusion of data was available for these children. Unfortunately, this information is not available for children from other schools included in the study and so is of little value for across-the-board comparisons such as are being made presently. However, arrangements are going forward for a panel study of the pupils in this school.

### Treatment of the data

Two decks of cards were used to record the information. Deck one was used to record responses to the Inventory of Choices. Columns one through five of deck two were used to identify school, form, special grouping, and individual student. Columns six through ten record age and sex. Information from pages 8 and 9 of the questionnaire and that obtained directly from the headmasters' files was also coded and punched on the cards of this second deck. After the scale scores were obtained by manipulating the cards of the first deck, these scores were transferred to the second deck. Numerous tables of information relating two or more variables were then produced.

## The Panel Study

### The sample

In the spring semester of 1960, individual interviews were conducted by the two principal researchers with 91 of the boys included in the Berkeley Elementary Schools study. These boys were then in the seventh grade of the junior high school (there are three in Berkeley) with the exception of one who had been retained in the sixth grade. The boys were selected from a cross-classification of residential and occupational strata, but within strata, according to the definiteness of the orientations of their interests rather than randomly. A single sex was chosen in order to eliminate immediately a troublesome variable, and boys were chosen rather than girls, chiefly because of a major interest in the relations between occupational aspiration, interest, achievement, and influence of father. Girls' occupational aspirations cannot be expected to vary as widely as those of boys.

## The instrument

The final interview schedule used is reproduced in Appendix B. It is the end product of a long evolutionary line. It is highly structured. Such an interview schedule is less likely than one with less structure to produce unanticipated information, but comparisons of data are far more sure, and the patterns of growth and change which may be revealed by a panel study, can be established with a high degree of certainty.

## Recording the interviews

Audograph records of all interviews are on file and these have been typescripted. Information has been coded and punched on IBM cards in accordance with the pre-coding indicated on the schedule. Much of the information obtained is useful in and of itself, for example the percentage of boys whose vocational choice was largely influenced by the father. Other information is useful in comparison with scale scores, personal and familial characteristics, and educational and vocational aspirations.

Information obtained from the initial interviews may be expected to corroborate or to contradict information obtained generally from the questionnaires. Subsequent protocols should enable patterns of growth and change to be determined.

## Replicating Data from Berkeley

During the past month, inventories of choice have been administered by the teachers to all pupils in grades 5 and 8. New test data for IQ, reading achievement, and arithmetic achievement, have been collected for those in grade 8 who were in the Berkeley Elementary study. For those in grade 5 who took part in the study when they were in grade 3, the teachers have been asked to indicate those to whom they would assign A or B grades.

None of these data have been processed, but information from nearly 1000 of the children who were in the former study has been obtained. Analysis and tabulation of this information can be expected to provide valuable understanding of attitude development.

The most significant part of the re-testing program is that both the high school and the elementary forms of the inventory of choices have been given to the sample of pupils now in the eighth grade. Cross-validation of the two forms is anticipated.

# APPENDIX B

## INSTRUMENTS USED IN THE COLLECTION
## OF THE DATA
## AND
## CHECK CHART
## OF DATA COLLECTED

# BAY AREA STUDY

## The High School Inventory

### Final Form

# BAY AREA STUDY

## The High School Inventory

### Final Form

You are being requested to cooperate in a research study being conducted at the University of California at Berkeley into the relations between students' attitudes toward a variety of topics and their school, recreational, and occupational interests. The information you provide will be held in strict confidence.

You are asked to give your personal opinions about many statements. There are no "right" or "wrong" answers. If you have difficulty deciding on some items, mark the answer which seems closest to what you believe even though you may have doubts. It is important to mark every item.

There is no time limit, but you are expected to finish in less than an hour, so do not spend too long on any one item.

Fill in the blanks below, then turn the page and begin reading the statements and marking your answers.

NAME ______________________ (Last) (First) (Initial) DATE ______________

SEX ______ (M or F) BIRTH DATE ______________ CLASS ______________ (L10, H10, L11, etc.)

SCHOOL ______________________ CITY ______________________

DIRECTIONS: Underneath each statement below, place a check before the answer that corresponds most closely with your attitude toward the statement. (Pay no attention to the extra numbers in the margins--they are for "coding" purposes.)

1-4.

5. 1

6. I am more interested in finding out how TV has affected people's taste than in finding out how TV works.
   1. ____ strongly agree
   2. ____ moderately agree
   3. ____ slightly agree
   4. ____ slightly disagree
   5. ____ moderately disagree
   6. ____ strongly disagree

7. If I were employed by a company manufacturing chemicals, I would rather stay in research than become a company executive, so long as the loss in pay was not too great.
   1. ____ strongly agree
   2. ____ moderately agree
   3. ____ slightly agree
   4. ____ slightly disagree
   5. ____ moderately disagree
   6. ____ strongly disagree

8. I find painting interesting when I am able to see how they represent the artists' attitudes toward life.
   1. ____ strongly agree
   2. ____ moderately agree
   3. ____ slightly agree
   4. ____ slightly disagree
   5. ____ moderately disagree
   6. ____ strongly disagree

9. The opinion of friends helps more than reading in making up my mind.
   1. ____ strongly agree
   2. ____ moderately agree
   3. ____ slightly agree
   4. ____ slightly disagree
   5. ____ moderately disagree
   6. ____ strongly disagree

10. I enjoy swimming in the ocean by myself, or, for safety, with a companion or life guard, more than swimming in a pool.
    1. ____ strongly agree
    2. ____ moderately agree
    3. ____ slightly agree
    4. ____ slightly disagree
    5. ____ moderately disagree
    6. ____ strongly disagree

11. School mathematics courses should concentrate more on practical consumer and business training.
    1. ____ strongly agree
    2. ____ moderately agree
    3. ____ slightly agree
    4. ____ slightly disagree
    5. ____ moderately disagree
    6. ____ strongly disagree

12. Fabulous IBM machines are used to calculate insurance rates. However data must be fed into the machines. The interviewing techniques for collecting data interest me more than an explanation of how the machines work.
    1. ____ strongly agree
    2. ____ moderately agree
    3. ____ slightly agree
    4. ____ slightly disagree
    5. ____ moderately disagree
    6. ____ strongly disagree

13. Medical experiments using live animals are cruel and inhuman.
    1. ____ strongly agree
    2. ____ moderately agree
    3. ____ slightly agree
    4. ____ slightly disagree
    5. ____ moderately disagree
    6. ____ strongly disagree

14. I never worry about how things are going to work out--they usually seem to take care of themselves.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

15. When I'm watching a movie I sometimes lose track of the plot because I'm wondering how the lighting and stage effects are worked.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

16. I like to ride alone. The feel of a good horse under me, his strength and his rhythm, more than make up for the lack of fellow riders.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

17. I would rather teach science than do research.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

18. "Hotrod" racing would be fun if you didn't have to know about and work on motors.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

19. I should rather be elected to the Student Council than be selected as an honor student in science.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

20. I think I should enjoy Longfellow's poem, "Evangeline", more if it were told as a love story in modern prose.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

21. In our complex industrial civilization a young person should specialize early and stick to it.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

22. I prefer chess to checkers.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

23. Sailing on a boat would be fun with a group of people, but I don't think I'd care much for it by myself.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

24. When talking with my friends in the evening I'd rather talk about people we know and have fun with than talk about religion or philosophy.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

25. To my way of thinking, the need to keep a city beautiful to look at is the most important argument in favor of smog control.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

26. The forces of nature are subjects for wonder and awe--not analysis.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

27. I usually like to do math problems alone rather than discuss them with others.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

28. In a social studies course I would rather have the reasons why the U.S. didn't join the League of Nations explained to me than to figure it out.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

29. I would rather go sailing by myself than watch a football game.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

30. It's a sloppy sailor who'll let his sails flap while he basks in the sun and breathes the crisp salty wetness of the air; the keen sailor watches the wind, studies the tides and understands details of the rigging.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

31. The foreign policy of our government should be based on high moral principles even though this may entail a loss of strategic power or prestige.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

32. Visiting a foreign country I would want to see the pageantry and architecture so I would not be interested in knowing in advance about their customs and history.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

33. Scientists destroy much of the beauty of nature when they explain away its mysteries.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

34. Art should be appreciated intuitively. Analysis destroys its beauty.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

35. I would rather study algebra than history even though algebra seems to be almost totally unrelated to any other subject.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

36. When I'm studying math or science it is refreshing to take frequent breaks watching TV or talking with a friend.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

37. I should prefer to be a machinist rather than a salesman.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

38. I never wonder how the time is going when I'm painting a room or sawing firewood like I do when I'm studying math or physics.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

39. If pay, housing, etc., were equal, I should like the work of a forest ranger better than that of a minister.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

40. I am more interested in following newspaper reports on the recent discoveries regarding "negative matter" than on the developments in racial integration in the schools.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

41. I should prefer the live theater to movies if they were the same price.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

42. I spend more of my free time on hobbies like stamp collecting, woodwork, etc., than going to parties or entertaining friends.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

43. When I was little I liked erector sets more than tops.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

44. I frequently think about the reasons for other people's misbehavior instead of reacting with irritation.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

45. I should rather read and be able to understand William Shakespeare's *Hamlet* than Michael Faraday's *Experimental Researches in Electricity*.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

46. I can visualize myself reading a paper to a scientific society meeting but not chatting socially in the corridor while a meeting is in progress.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

47. Instead of developing expensive tastes, what I would like most to get from my education is either a purpose for my life or an affirmation of my present purposes.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

48. Abilities of sign writers are different from the abilities of men who run a sign business. If I had the ability to do either, I would rather learn to run the business than paint the signs.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

49. I like history and civics much better than science and mathematics.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

50. Science has definitely not been able to show that colored races are inferior to white races.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

51. I don't like being interrupted while I'm doing laboratory experiments by friends who feel like talking.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

52. A person should throw himself into life with vitality--the scientist's reflection on how things work is a wet blanket on the spontaneous pleasures of affection.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

53. If I were a musician the thing I should like best about it would be getting across to the audience the basic idea of the composer.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

54. In studying about the building of the pyramids, I should be more interested in the engineering feat than in the class structure and economy of Egypt which made such magnificient display possible.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

55. I like Dixieland jazz better than "rock and roll."
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

56. A businessman should make his decisions strictly according to the interests of his business. He should not worry about what happens nationally to wages and prices.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

57. Because they need to get close to life, artists are entitled to special consideration if they treat lightly the ties of marriage.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

58. I would sooner have a big living room for parties than have a workroom for hobbies.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

59. When I see an article about "electronic brains" I am more interested in finding out how they work than what their uses are.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

60. When I am buying clothes I pay less attention to the ones that don't show than to the ones that do show.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

61. When you go on an automobile trip it is much more fun to pick places to stay as you go along rather than writing ahead for reservations.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

62. I should rather take a shop course than a world history course.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

63. I would rather be known as the writer of a social column published in many papers than as the Director of an astronomical observatory.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

64. If I had an hour to wait for a train I should more likely read The Scientific American than The Atlantic Monthly.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

65. An impulsive person is warm and sincere; one who analyzes his emotions is cold and "phony."
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

66. Chemistry experiments are fun to watch so long as there are plenty of explosions and color changes.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

67. I prefer a science class that is run along fairly formal lines so that I can avoid the distractions arising from personal entanglements with other members of the class.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

68. A girl should wear sweaters and "pearls" or whatever most of the girls are wearing rather than conspicuous handmade jewelry.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

69. Nobody should be allowed to cut down the redwood forests and turn them into lumber.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

70. Sometimes when a fellow is out with the gang, he pretty well has to do a few things he knows he really shouldn't.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

71. If I were interested in studying flowers, I should be attracted chiefly by the beauty of the flowers. Comparing the structure of different kinds of flowers would not interest me much.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

72. If I had the necessary athletic prowess I should prefer to excel in the cross-country marathon than in football.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

73. In science fiction stories, I like the ones with interesting scientific theories that hang together, even if they're not completely true, better than those about the social problems of space settlements.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

74. I enjoy working hard at a science project even if others don't recognize my accomplishment.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

75. I like to watch a big house afire.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

76. Mercy killing should be legalized for cases of extreme suffering where there is no hope for cure.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

77. When I look at the stars at night I sometimes meditate on the way the universe works.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

(Go right on to the next column.)

1-4.

5. 2

6. The way they are run now, labor unions do this country more harm than good.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

7. Big companies control too much of American business.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

8. It should be the job of the schools to teach students the wisdom of tradition rather than allow students to find out what is good in life the hard way.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

9. Newspapers should be allowed to criticize our form of government.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

10. There are too many people working for the government these days.
1. ____ strongly agree
2. ____ moderately agree
3. ____ slightly agree
4. ____ slightly disagree
5. ____ moderately disagree
6. ____ strongly disagree

11. The political party I favor is--
1. ____Republican
2. ____Democrat
3. ____Socialist
4. ____other
5. ____none

12. My father's education was--
1. ____some grade school
2. ____finished grade school
3. ____some high school
4. ____finished high school
5. ____some college
6. ____graduated from college
7. ____some post-graduate work
8. ____completed a graduate degree (M.D., Ph.D., D.Sc., etc.)

13. My mother's education was--
1. ____some grade school
2. ____finished grade school
3. ____some high school
4. ____finished high school
5. ____some college
6. ____graduated from college
7. ____some post-graduate work
8. ____completed a graduate degree (M.D., Ph.D., D.Sc., etc.)

14. My race is--
1. ____Negro
2. ____Oriental
3. ____White

15. My religion is--
1. ____Baptist
2. ____Methodist
3. ____Lutheran
4. ____other Protestant denomination

____________________
(What denomination?)

5. ____Roman Catholic
6. ____Greek Orthodox
7. ____other religion

____________________
(What religion?)

16. I attend Church--
1. ____regularly
2. ____occasionally
3. ____almost never

17. After I graduate from high school (and, if necessary, serve in the military forces)--
1. ____I plan to get a job right away
2. ____I plan to be a housewife
3. ____I plan to go to a technical or trade school
4. ____I plan to go to a junior college
5. ____I plan to go first to a junior college, and then to a four-year college or university
6. ____I plan to go directly to a four-year college or university
7. ____I have other plans

____________________
(What are they?)

18. The subject from the list below that I have liked best at high school is number--____.
1. English
2. Mathematics
3. Shop or Industrial Arts
4. Foreign Language
5. Biology
6. Social Studies
7. Art
8. Chemistry
9. Music
0. General Science

19. The subject from the list above that I have liked least is number--____

20. My family has lived in California for about--
1. ____less than one year
2. ____less than two years
3. ____less than five years
4. ____less than ten years
5. ____10-24 years
6. ____25-49 years
7. ____50-74 years
8. ____75-99 years
9. ____over 100 years

21. The job or occupation I would like to have ten years from now is--

______________________________________________

What, exactly, would you like to be doing in this occupation?

______________________________________________

Would you expect to work for yourself or for someone else?

____ self-employed
____ work for wages or salary

22. My father's (or step-father's) job or occupation is--

______________________________________________

Just what does your father do in his job?

______________________________________________

My father-- ___ is self-employed
___ works for wages or salary

My father-- ___ belongs to a trade-union
___ does not belong to a trade-union

23. I was born in--______________________________
(city) (state) (country)

24. My father was born in--______________________
(city) (state) (country)

25. How many brothers and sisters do you have in your family? (Write numbers on the blanks.)

____ older brothers ____younger brothers
____ older sisters ____younger sisters

26. The school activities--clubs, teams, etc.,--that I have participated in this year at high school are--

| Name of group | Number of times you meet or attend each month |
|---|---|
| ______________________________ | |
| ______________________________ | |
| ______________________________ | |
| ______________________________ | |
| ______________________________ | |

Please do not write in this margin

21. _____
22. _____
23. _____
24. _____
25. _____
26. _____
27. _____
28. _____
29. _____
30. _____
31. _____
32. _____
33. _____
34. _____

Please do not write in this margin

27. The out-of-school activities--clubs, church groups, scouts, etc.,--that I participate in are--

| Name of group | Number of times you meet or attend each month | |
|---|---|---|
| ______________________ | ______________ | 36. ____ |
| ______________________ | ______________ | 37. ____ |
| ______________________ | ______________ | |
| ______________________ | ______________ | 38. ____ |

28. Have you ever held an office in any high school group?
___ yes
___ no

39. ____

If you have, what office did (or do) you hold?

______________________ (name of office)
______________________ (name of group)

29. Are there any other activities or hobbies that occupy a good deal of your free time that you haven't mentioned above?

40. ____

______________________________________ 41. ____

______________________________________ 42. ____

______________________________________

30. In general, considering all extra curricular activities, do you consider yourself--
___ very active
___ fairly active
___ not very active

43. ____

31. If you had to give up all of your activities except one, which one of the activities or groups you have named above would you keep?

______________________________________ 44. ____

PLEASE CHECK OVER YOUR PAPER TO MAKE SURE YOU HAVE NOT SKIPPED A PAGE OR A COLUMN.

**Not distributed to students**

NAME___ BIRTH DATE___

45. Sex
    1. ___ Male
    2. ___ Female

46. Age
    1. ___ 12
    2. ___ 13
    3. ___ 14
    4. ___ 15
    5. ___ 16
    6. ___ 17
    7. ___ 18
    8. ___ 19
    9. ___ 20

47. Class
    1. ___ L10
    2. ___ H10
    3. ___ L11
    4. ___ H11
    5. ___ L12
    6. ___ H12

48. School
    1. ___
    2. ___
    3. ___
    4. ___
    5. ___
    6. ___
    7. ___
    8. ___
    9. ___
    0. ___
    x. ___
    y. ___

49. IQ test ___________
    Date ___________
    1. ___ 150 and over
    2. ___ 140-149
    3. ___ 130-139
    4. ___ 120-129
    5. ___ 110-119
    6. ___ 100-109
    7. ___ 90-99
    8. ___ 80-89
    9. ___ 70-79
    0. ___ 60-69
    x. ___ below 60
    y. ___ not available

50. Verbal scale
    1. ___ 150 and over
    2. ___ 140-149
    3. ___ 130-139
    4. ___ 120-129
    5. ___ 110-119
    6. ___ 100-109
    7. ___ 90-99
    8. ___ 80-89
    9. ___ 70-79
    0. ___ 60-69
    x. ___ below 60
    y. ___ not available

51. Performance scale
    1. ___ 150 and over
    2. ___ 140-149
    3. ___ 130-139
    4. ___ 120-129
    5. ___ 110-119
    6. ___ 100-109
    7. ___ 90-99
    8. ___ 80-89
    9. ___ 70-79
    0. ___ 60-69
    x. ___ below 60
    y. ___ not available

52. Median grade in social studies and English
    1. ___ A
    2. ___ B
    3. ___ C
    4. ___ D
    5. ___ F
    y. ___ not available

53. Median grade in math
    1. ___ A
    2. ___ B
    3. ___ C
    4. ___ D
    5. ___ F
    y. ___ not available

54. Median grade in science
    1. ___ A
    2. ___ B
    3. ___ C
    4. ___ D
    5. ___ F
    y. ___ not available

55. Median grade in chemistry & physics
    1. ___ A
    2. ___ B
    3. ___ C
    4. ___ D
    5. ___ F
    y. ___ not available

56. Median academic grade
    1. ___ A
    2. ___ B
    3. ___ C
    4. ___ D
    5. ___ F
    y. ___ not available

57. Median "citizenship" grade
    1. ___ A
    2. ___ B
    3. ___ C
    4. ___ D
    5. ___ F
    y. ___ not available

# BAY AREA STUDY

## Orientation of Fathers' Occupations

## and of

## Students' Occupational Aspirations

## ORIENTATION OF OCCUPATION

| OCCUPATIONAL STATUS | 1 - Prudent | 2 - Theoretic | 3 - Aesthetic | 4 - Immediate | y - Not Classifiable |
|---|---|---|---|---|---|
| 1 - Manual: semi- and un-skilled | | | machine operator, truck driver, janitor, gardener, domestic, "laborer", seamstress, hod carrier, mechanic's helper, etc. | | Army private, PFC, Cpl.; Navy seaman |
| 2 - Manual: skilled | | | journeyman: printer, welder, sheet metal worker, electrician, painter, carpenter, radio-TV repairman, baker, forester | | Army tech & staff sgts.; Navy petty officers |
| 3 - Lower white collar | nurse's assistant, practical nurse, camp counselor | Radiation Laboratory: electronics technician, radar technician | postman, fireman, bus driver, professional athlete, fireman, dance instructor, model, beautician, copy draftsman, photo technician, laboratory assistant | sales clerk, bookkeeper, stenographer secretary, union official, foreman, policeman, guard, stewardess, waiter, bar tender, driver-salesman (e.g., bread, milk), inspector | Army master or 1st sgt, warrant; Navy chief petty officer, warrant-bosun; Coast Guard mate |
| 4 - Upper white collar | public school teacher, nurse, librarian, social welfare worker, probation officer, city playground director, adult education | pilot, laboratory technician, high school science teacher, chemical technician, accelerator technician (Rad Lab) | music teacher, dress designer, commercial artist, cartoonist, dance band musician, design draftsmen, fish and game warden, PE teacher, dental tech, dietician, materials designer | salesman, store manager, chief of police, buyer, purchasing agent, office manager, claims adjustor, FBI, police captain, ass't sales manager | Army lieutenants, captain; Navy chief warrant, ensign, lieutenants |

|  | 1 - Prudent | 2 - Theoretic | 3 - Aesthetic | 4 - Immediate | y - Not Classifiable |
|---|---|---|---|---|---|
| 5 - Self Employed: Artisan |  |  | mechanic, barber, shoemaker, nurseryman, taxidermist, plumber, carpenter-contractor, grinding-shop owner, jeweler (watch repair), gardener, dog-trainer, piano technician |  |  |
| 6 - Self Employed: Merchant |  |  |  | retail store owner (e.g., grocery, variety), export-import business, broker, druggist, contractor, mortician |  |
| 7 - Self Employed: Farmer |  |  | farmer, rancher, horse breeder or trainer |  |  |
| 8 - Professional: Salaried | professor of social science or humanities, judge, minister, missionary, editor, journalist, criminologist, high school principal | professor of natural science or mathematics, engineer, scientist, medical research, research forester, aeronautical engineer | professor of music, art, or architecture | chief accountant and statistician for a group of insurance companies | Army major, colonels, Navy commanders, captain |

|  | 1 - Prudent | 2 - Theoretic | 3 - Aesthetic | 4 - Immediate | y - Not Classifiable |
|---|---|---|---|---|---|
| 9 - Professional: Self Employed | doctor, psychiatrist, lawyer, author |  | architect, dentist, veterinarian, automobile designer | certified public accountant |  |
| 0 - Executive | senator, representative, governor, president (of USA) |  |  | sales manager, factory representative, corporation executives, sales engineer, production engineer, management consultant, university comptroller, registrar | general, admiral |
| x - Miscellaneous |  |  | farm laborer |  | x - x: housewife |
| y - Not Classifiable | "working to make peace in the world", etc. | "Radiation Lab", "work with minerals", "electronics" | artist, musician, actress, TV or movie star, ballet dancer, violinist, tap dancer, champion ice skater, organist | "businessman", "office work" | no response, "don't know", not classifiable (e.g., name of a company), student, unemployed, "army", "navy", "WAC", "WAVE", deceased, retired (former occupation not given) |

## ELEMENTARY SCHOOLS

## Evolutionary Forms of the Inventory

# ELEMENTARY SCHOOLS Form A Questionnaire

You are being asked to cooperate in a research study which is being conducted at the University of California on students' opinions and interests. The opinions you express will not be known by anyone aside from those at the University who are conducting this study. Please answer all of the questions frankly.

In each question you are given a situation. You are asked first to choose which of two things you would rather do in that situation, and then to check how much you would rather do the thing you chose than the other thing. Look at the example below.

0. If my family were to buy a new automobile, I'd rather they bought

| | |
|---|---|
| ____a Buick | ____strongly |
| ____a Chevrolet | ____somewhat |
| | ____slightly |

Make a choice even if you don't care much one way or another. Don't leave any question out. If you don't much care, you should check "slightly" on the lowest blank at the right-hand side. If you much prefer the choice you made--if it would make a big difference to you--check "strongly" on the right. If you definitely prefer one, but don't feel very strongly about it, check "somewhat", in between.

You should make two checks for each question, then. One, on the lines on the left, to make your choice; and one, on the lines on the right, to show how strongly you feel about your choice.

This is not a test of how much you know or how well you can read. There are no "right" or "wrong" answers. If you can't read a question, or don't understand one, raise your hand for help. Please write your name on the line below.

Name . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
(Last) (First) (Initial)

1. If we were going to study about television in school,

___I'd like to find out how TV sets are made and how they work.
___I'd like to find out how watching TV affects people.

___strongly
___somewhat
___slightly

2. If, after I got out of school, I were hired by a company which made chemicals,

___I'd like to be a sales executive who makes deals with businessmen.
___I'd like to work in the laboratories as an inventor.

___strongly
___somewhat
___slightly

3. When I look at a painting in a museum,

___I like it if the color and design are interesting, even if I don't know what it is supposed to mean.
___I like it only if I can understand what the painter meant.

___strongly
___somewhat
___slightly

4. If I wanted to decide how good the Russian schools were,

___I would ask my friends what they think.
___I would read about what goes on in Russian schools.

___strongly
___somewhat
___slightly

5. If I were to go swimming, I'd rather

___swim at an ocean beach with one or two friends.
___swim in a pool with a bunch of my friends

___strongly
___somewhat
___slightly

6. In arithmetic, teachers should

___only teach things which will be useful, like how to handle money.
___have more puzzles and "brain teasers" which are interesting and fun.

___strongly
___somewhat
___slightly

7. Big machines are used to work out the cost of car insurance, but they need to know things about people who drive cars. I would rather

___ask questions of car drivers.
___try to make the machines work better.

___strongly
___somewhat
___slightly

8. Medical experiments using live animals

___are cruel and should be stopped.
___are needed to find out things which will save people's lives later on.

___strongly
___somewhat
___slightly

9. When things go wrong

___I worry and think about them.
___I never worry because things will work themselves out anyway sooner or later

___strongly
___somewhat
___slightly

10. When I'm watching a movie

___I'm so busy following the story that I never think about how the movie is made while I'm watching it
___I sometimes wonder how the lighting, stage effects, or trick shots are done.

___strongly
___somewhat
___slightly

11. If I were to go horseback riding, I'd rather ride

___with a group of friends so we could talk and have fun.
___by myself so that I could enjoy the ride without being bothered by other people.

___strongly
___somewhat
___slightly

12. If I knew a lot about science, I'd rather

___teach science to students.
___work in a laboratory trying to discover new things.

___strongly
___somewhat
___slightly

13. What I would like most if I were a teen-ager with a hot-rod would be

___working on the motor.
___driving it.

___strongly
___somewhat
___slightly

14. I would rather

___be elected president of my class.
___get A's in arithmetic and science.

___strongly
___somewhat
___slightly

15. When I read, or the teacher reads us, a poem which tells a story

___I would rather have the story told without the poetry.
___I enjoy the rhythm of the poetry.

___strongly
___somewhat
___slightly

16. When I listen to the radio I'd rather hear

___a news commentary.
___a science program.

___strongly
___somewhat
___slightly

17. On a rainy-day recess at school I'd rather

___draw pictures.
___play chess.

___strongly
___somewhat
___slightly

18. If I had a sailboat, I'd rather

___sail with a group of people
___go sailing by myself if I were able to.

___strongly
___somewhat
___slightly

19. When I'm with my friends I like it best when we are

___talking about serious things like how to get along
well in school.
___laughing, playing, and having fun.

___strongly
___somewhat
___slightly

20. The most important reason for trying to get rid of smog is

___because smog is bad for people and crops.
___to keep the city looking clean and beautiful.

___strongly
___somewhat
___slightly

21. The marvels of nature, like sunsets and storms, should be

___studied and understood.
___admired and enjoyed.

___strongly
___somewhat
___slightly

22. When I am working on arithmetic problems, I like to

___figure them out by myself.
___talk them over with my friends and figure them out
together.

___strongly
___somewhat
___slightly

23. In social studies I like it when the teacher

___lets us work on important questions that we help
choose ourselves.
___explains everything and tells us just what we have
to learn.

___strongly
___somewhat
___slightly

24. On a Saturday afternoon I'd rather

___watch a football game.
___go boating by myself.

___strongly
___somewhat
___slightly

25. I think the most fun in sailing would be

___watching the winds and tides, understanding the
rigging, and keeping a "tight" ship
___enjoying the motion of the boat, the sunshine, and
the crisp salty wetness of the air.

___strongly
___somewhat
___slightly

26. In our relations with foreign countries, our country should

___always do what is fair, even if we don't always make
the best deal we can for ourselves
___do everything it can to make the U.S. stronger.

___strongly
___somewhat
___slightly

27. If I were going to take a trip to Mexico

___I'd be interested in seeing what the people look like, how they dress, what they eat, and what their homes look like, so I wouldn't need to study them beforehand.
___I'd like to know about how they live and the things they believe before I went so I could understand what I saw there.

___strongly
___somewhat
___slightly

28. When a scientist explains what causes a sunset

___it no longer seems beautiful.
___it is just as beautiful and mayby more marvelous.

___strongly
___somewhat
___slightly

29. When I look at a picture

___I enjoy it more if I can find out why I like it.
___finding out why I like it spoils it for me.

___strongly
___somewhat
___slightly

30. I would rather study

___the lives of the vice-presidents in social studies.
___fractions in arithmetic.

___strongly
___somewhat
___slightly

31. When I have arithmetic homework to do

___I like to take breaks watching TV or talking.
___I like to concentrate and stick with it until I'm finished.

___strongly
___somewhat
___slightly

32. When I have finished school and get a job, I'd rather be

___a salesman.
___a machinist.

___strongly
___somewhat
___slightly

33. Time seems to go much faster when I'm

___doing arithmetic problems.
___helping around the house.

___strongly
___somewhat
___slightly

34. If the pay were the same, I'd rather do the work of

___a minister.
___a forest ranger.

___strongly
___somewhat
___slightly

35. I am more interested in the news about _

___race problems in the schools of the South.
___space missiles.

___strongly
___somewhat
___slightly

36. If they were the same price, I'd rather see

___a movie
___a play performed by live actors in a theater

___strongly
___somewhat
___slightly

37. I would rather spend a Saturday afternoon

___working on a hobby like stamp-collecting or woodwork.
___going to a party or playing with friends.

___strongly
___somewhat
___slightly

38. When I was little I liked to play with

___tops.
___erector sets.

___strongly
___somewhat
___slightly

39. When someone does something mean to me

___I get mad.
___I try to figure out why.

___strongly
___somewhat
___slightly

40. I would rather read a book about

___different religions.
___electricity and magnetism.

___strongly
___somewhat
___slightly

41. On a class trip I'd rather

___play games in a recreation park.
___visit an atom-smasher at the University.

___strongly
___somewhat
___slightly

42. An education should give a person

___a purpose for life.
___expensive tastes for nice things.

___strongly
___somewhat
___slightly

43. If I worked in a place that made signs I'd rather

___paint the signs.
___work in the office.

___strongly
___somewhat
___slightly

44. I would rather study about

___science. ___strongly
___the duties of being a citizen. ___somewhat
___slightly

45. When I have finished school and get a job, I'd rather by

___a banker. ___strongly
___a judge. ___somewhat
___slightly

46. When I'm making something or doing an experiment and a friend drops by,

___I like to stop and show him what I'm doing. ___strongly
___I wish he'd go away and come back when I've finished. ___somewhat
___slightly

47. During a rain-storm I'd rather

___see what the barometer does. ___strongly
___watch the rain. ___somewhat
___slightly

48. If I were a musician, the thing I should like best about it would be

___getting the idea of the music across to the audience. ___strongly
___enjoying the tune and beat of the music. ___somewhat
___slightly

49. If we were studying about the building of the pyramids in Egypt, I would want to know

___how they were built. ___strongly
___why the kings went to so much trouble and expense to have them built. ___somewhat
___slightly

50. When I listen to popular music on the radio

___I like "rock and roll". ___strongly
___I like Dixieland jazz. ___somewhat
___slightly

51. If I were selling something to a friend I would

___charge what I thought was a fair price. ___strongly
___get as much out of him as I could. ___somewhat
___slightly

52. If I knew a famous artist who was always selfish

___I wouldn't think much of him. ___strongly
___I wouldn't mind his being selfish because he was ___somewhat
so good at art--anybody can be unselfish, but only ___slightly
a few can be really good artists.

53. When I watch TV I'd rather see

___a science program. ___strongly
___a comedy. ___somewhat
___slightly

54. When I hear about "electronic brains" I am more interested in finding out

___how they work. ___strongly
___what they are used for. ___somewhat
___slightly

55. When I am choosing clothes to wear

___I choose things that I think other people will like. ___strongly
___I choose things that strike me as good-looking even ___somewhat
if they're not the latest style. ___slightly

56. If we went to visit a big steel factory, I'd rather

___find out how steel is hardened. ___strongly
___watch the blast-furnaces. ___somewhat
___slightly

57. In school I'd rather learn about

___how to use power tools. ___strongly
___the history of how people lived long ago. ___somewhat
___slightly

58. I would rather

___be the director of an observatory where they study ___strongly
the stars. ___somewhat
___write a social column which appeared in many ___slightly
newspapers.

59. If I had an hour to wait for a train, I'd more likely read

___Popular Science Monthly. ___strongly
___Biographies of Famous Statesmen. ___somewhat
___slightly

60. A person is much more fun to be with if he

___just naturally does what he feels like ___strongly
___is careful and thinks about what he does. ___somewhat
___slightly

61. Chemistry experiments would be fun to watch

___if there were plenty of explosions and color changes.
___if you could understand the reason why things happened.

___strongly
___somewhat
___slightly

62. In arithmetic I like a teacher who

___runs the class strictly so we don't waste time
___lets us play arithmetic games and work in groups so that it is more fun.

___strongly
___somewhat
___slightly

63. Girls should wear

___interesting and different clothes and jewelry.
___whatever most of the girls are wearing.

___strongly
___somewhat
___slightly

64. When I drive through the redwood forests I think

___nobody should be allowed to cut down these trees for lumber.
___it would be all right for them to cut some of them down for lumber if they left quite a few trees standing.

___strongly
___somewhat
___slightly

65. When a fellow is out with the gang

___he should do what he thinks is right even if the others think he is chicken.
___he has to go along with them even if they do some things he knows he really shouldn't.

___strongly
___somewhat
___slightly

66. If I were studying flowers I should like best

___comparing the different ways in which flowers are put together.
___the beauty of the flowers.

___strongly
___somewhat
___slightly

67. If I were an athlete I'd like to be

___a football player.
___a cross-country runner.

___strongly
___somewhat
___slightly

68. When I read science fiction stories or see them on TV, I like the ones that tell about

___possible scientific inventions like time machines.
___the troubles of space settlers.

___strongly
___somewhat
___slightly

69. I would like to work on a special science project

___even if no one knew about it.
___if other people would admire what I had done.

___strongly
___somewhat
___slightly

70. When I see a big house burning

___I think it is exciting
___I'm unhappy at the waste and worried about whether anyone might be hurt.

___strongly
___somewhat
___slightly

71. Capital punishment is all right

___because people who do wrong should be punished.
___if it keeps other people from doing wrong.

___strongly
___somewhat
___slightly

72. When I look at the stars at night

___I sometimes wonder what keeps them there.
___I think they are beautiful.

___strongly
___somewhat
___slightly

Thank you very much.

ELEMENTARY SCHOOLS Form B Questionnaire

You are being asked to cooperate in a research study which is being conducted at the University of California on students' opinions and interests. The opinions you express will not be known by anyone aside from those at the University who are conducting this study. Please answer all of the questions frankly.

In each question you are given a situation. You are asked first to choose which of two things you would rather do in that situation, and then to check how much you would rather do the thing you chose than the other thing. Look at the example below.

0. If my family were to buy a new automobile, I'd rather they bought

___a Buick.
___a Chevrolet.

___much ___somewhat ___slightly

___a Ford.
___a Buick.

___much ___somewhat ___slightly

___a Chevrolet.
___a Ford.

___much ___somewhat ___slightly

Make a choice even if you don't care much one way or another. Don't leave any question out. If you don't much care, you should check "slightly" on the line underneath the choice. If you much prefer the choice you made--if it would make a big difference to you--check "much". If you definitely prefer one, buy don't feel very strongly about it, check "somewhat", in between.

You should make two checks for each question, then. One, on one of the lines sticking out on the left, to make your choice; and one, on one of the lines in the row underneath, to show how strongly you feel about your choice. If you have not already done so, make your checks on the example above now.

This is not a test of how much you know or how well you can read. There are no "right" or "wrong" answers. If you can't read a question, or don't understand one, raise your hand for help. Please write your name on the line below.

Name . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
(Last) (First) (Initial)

1. On the weekend I'd rather

___read a book about different religions like those started by Mohammed or Buddha.
___work with a chemistry set.

___much ___somewhat ___slightly

___read a book about different religions like those started by Mohammed or Buddha.
___go boating on the Bay.

___much ___somewhat ___slightly

___go to a party.
___work with a chemistry set.

___much ___somewhat ___slightly

___go to a party.
___read a book about different religions like those started by Mohammed or Buddha.

___much ___somewhat ___slightly

___go to a party.
___go boating on the Bay.

___much ___somewhat ___slightly

___work with a chemistry set.
___go boating on the Bay.

___much ___somewhat ___slightly

2. On a rainy-day recess at school I'd rather

___draw or paint.
___play chess.

___much ___somewhat ___slightly

___play chess.
___talk with friends.

___much ___somewhat ___slightly

___talk with friends.
___draw or paint.

___much ___somewhat ___slightly

(Go on to the top of the next column.)

___discuss class problems.
___draw or paint.

___much ___somewhat ___slightly

___discuss class problems.
___play chess.

___much ___somewhat ___slightly

___discuss class problems.
___talk with friends.

___much ___somewhat ___slightly

3. The school activity I prefer is

___"sharing".
___arithmetic.

___much ___somewhat ___slightly

___social studies.
___"sharing".

___much ___somewhat ___slightly

___art.
___arithmetic.

___much ___somewhat ___slightly

___"sharing".
___art.

___much ___somewhat ___slightly

___art.
___social studies.

___much ___somewhat ___slightly

___arithmetic.
___social studies.

___much ___somewhat ___slightly

4. When I have finished school and get a job, I'd rather

___work in a scientific laboratory.
___be a salesman.

___much ___somewhat ___slightly

(Go on to the top of the next page.)

___work in a scientific laboratory.
___teach school.

___much ___somewhat ___slightly

___be a salesman.
___teach school.

___much ___somewhat ___slightly

___work in a scientific laboratory.
___be a musician.

___much ___somewhat ___slightly

___teach school.
___be a musician.

___much ___somewhat ___slightly

___be a salesman.
___be a musician.

___much ___somewhat ___slightly

5. On a class trip I'd rather

___visit an atom-smasher at the University.
___play games in a recreation park.

___much ___somewhat ___slightly

___visit a session of the state legislature at Sacramento.
___watch animals in the zoo.

___much ___somewhat ___slightly

___play games in a recreation park.
___watch animals in the zoo.

___much ___somewhat ___slightly

___visit a session of the state legislature at Sacramento.
___play games in a recreation park.

___much ___somewhat ___slightly

___visit a session of the state legislature at Sacramento.
___visit an atom-smasher at the University.

___much ___somewhat ___slightly

(Go on to the top of the next column.)

___visit an atom-smasher at the University.
___watch animals in the zoo.

___much ___somewhat ___slightly

6. At a party I'd rather

___play games.
___go to the Planetarium.

___much ___somewhat ___slightly

___play games.
___watch a movie about how people live in China.

___much ___somewhat ___slightly

___go to the Planetarium.
___sing songs.

___much ___somewhat ___slightly

___play games.
___sing songs.

___much ___somewhat ___slightly

___sing songs.
___watch a movie about how people live in China.

___much ___somewhat ___slightly

___watch a movie about how people live in China.
___go to the Planetarium.

___much ___somewhat ___slightly

7. On Sunday morning I'd rather

___meet with a club.
___visit a church that I didn't know anything about.

___much ___somewhat ___slightly

___ride a bicycle.
___meet with a club.

___much ___somewhat ___slightly

(Go on to the top of the next page.)

___visit a church that I didn't know anything about.
___ride a bicycle.

___much ___somewhat ___slightly

___build something with an erector set.
___ride a bicycle.

___much ___somewhat ___slightly

___meet with a club.
___build something with an erector set.

___much ___somewhat ___slightly

___visit a church that I didn't know anything about.
___build something with an erector set.

___much ___somewhat ___slightly

8. In the afternoon after school I'd rather

___read the news.
___fly a kite.

___much ___somewhat ___slightly

___build a radio.
___read the news.

___much ___somewhat ___slightly

___play dodge ball.
___build a radio.

___much ___somewhat ___slightly

___play dodge ball.
___fly a kite.

___much ___somewhat ___slightly

___build a radio.
___fly a kite.

___much ___somewhat ___slightly

(Go on to the top of the next column.)

___play dodge ball.
___read the news.

___much ___somewhat ___slightly

9. When I watch TV I'd rather listen to

___music.
___a news commentary.

___much ___somewhat ___slightly

___a news commentary.
___a comedy.

___much ___somewhat ___slightly

___a science program.
___a news commentary.

___much ___somewhat ___slightly

___a science program.
___a comedy.

___much ___somewhat ___slightly

___a comedy.
___music.

___much ___somewhat ___slightly

___music.
___a science program.

___much ___somewhat ___slightly

10. When I have finished school and get a job, I'd rather be

___an airplane pilot.
___a judge.

___much ___somewhat ___slightly

___a judge.
___a scientist.

___much ___somewhat ___slightly

(Go on to the top of the next page.)

___a banker.
___a scientist.

___much ___somewhat ___slightly

___a scientist.
___an airplane pilot.

___much ___somewhat ___slightly

___a judge.
___a banker.

___much ___somewhat ___slightly

___a scientist.
___a banker.

___much ___somewhat ___slightly

11. During a rain-storm I'd rather

___watch the rain.
___see what the barometer does.

___much ___somewhat ___slightly

___watch the rain.
___watch how other people feel about it.

___much ___somewhat ___slightly

___play hide-and-seek.
___watch the rain.

___much ___somewhat ___slightly

___watch how other people feel about it.
___see what the barometer does.

___much ___somewhat ___slightly

___play hide-and-seek.
___watch how other people feel about it.

___much ___somewhat ___slightly

___play hide-and-seek
___see what the barometer does.

___much ___somewhat ___slightly

(Go on to the top of the next column.)

12. If we went to visit a big steel factory, I'd rather

___watch the blast-furnaces.
___find out how people are chosen for their jobs.

___much ___somewhat ___slightly

___find out how much money people make.
___find out how people are chosen for their jobs.

___much ___somewhat ___slightly

___find out how much money people make.
___watch the blast-furnaces.

___much ___somewhat ___slightly

___find out how steel is hardened.
___find out how people are chosen for their jobs.

___much ___somewhat ___slightly

___find out how steel is hardened.
___find out how much money people make.

___much ___somewhat ___slightly

___find out how steel is hardened.
___watch the blast-furnaces.

___much ___somewhat ___slightly

13. When our class gives a play I'd rather

___hook up and run the lights.
___choose the play.

___much ___somewhat ___slightly

___choose the play.
___work on costumes or scenery.

___much ___somewhat ___slightly

___choose the play.
___show people to their seats.

___much ___somewhat ___slightly

(Go on the the top of the next page.)

___show people to their seats.
___work on costumes or scenery.

___much ___somewhat ___slightly

___show people to their seats.
___hook up and run the lights.

___much ___somewhat ___slightly

___work on costumes or scenery.
___hook up and run the lights.

___much ___somewhat ___slightly

14. If I found a hundred dollars, I'd rather spend it on

___a microscope.
___a pony.

___much ___somewhat ___slightly

___a trip to the United Nations.
___a pony.

___much ___somewhat ___slightly

___a microscope.
___good-looking clothes.

___much ___somewhat ___slightly

___good looking clothes.
___a pony.

___much ___somewhat ___slightly

___a trip to the United Nations.
___good-looking clothes.

___much ___somewhat ___slightly

___a microscope.
___a trip to the United Nations.

___much ___somewhat ___slightly

(Thank you very much.)

# ELEMENTARY SCHOOLS Final Form Questionnaire

We would like you to help us with a study about students' opinions and interests which is being made at the University of California. The opinions you give will not be known by anyone aside from those at the University who are conducting this study. Please answer all of the questions frankly.

In each question you are given a situation. You are asked first to choose which of two things you would rather do in that situation, and then to check how much you would rather do the thing you choose than the other thing. Look at the example in the middle column.

Make a choice even if you don't care much one way or another. Don't leave any question out. If you much prefer the choice you made--if it would make a big difference to you--check "much" on the first blank on the line underneath the choice. If you definitely prefer one, but don't feel very strongly about it, check "somewhat", in the middle. If you only prefer your choice a little bit, check "slightly", on the right.

## Example

0. If my family were to buy a new automobile, I'd rather they bought

1. __a Buick.
__a Chevrolet.
__much__somewhat__slightly

2. __an Oldsmobile.
__a Buick.
__much__somewhat__slightly

3. __a Buick.
__a Ford.
__much__somewhat__slightly

4. __an Oldsmobile.
__a Chevrolet
__much__somewhat__slightly

5. __an Oldsmobile.
__a Ford.
__much__somewhat__slightly

6. __a Chevrolet.
__a Ford.
__much__somewhat__slightly

You should make two checks for each question, then. One, on one of the lines sticking out on the left, to make your choice; and one, on one of the lines in the row underneath, to show how strongly you feel about your choice. If you have not already done so, make your checks on the example now.

This is not a test of how much you know. There are no "right" or "wrong" answers. I will read all of the questions aloud to you. Please do not work ahead of me, and do not fall behind. Raise your hand if I read too fast or if there is anything you do not understand.

Please fill in the blanks below.

Your name: ______________________

Your teacher's name: ______________________

Your grade: ______________________

A. In the afternoon after school I'd rather

1. _read the news.
_fly a kite.

_much_somewhat_slightly

2. _build a radio.
_read the news.

_much_somewhat_slightly

3. _play dodge ball.
_build a radio.

_much_somewhat_slightly

4. _play dodge ball.
_fly a kite.

_much_somewhat_slightly

5. _build a radio.
_fly a kite.

_much_somewhat_slightly

6. _play dodge ball.
_read the news.

_much_somewhat_slightly

B. On a class trip I'd rather

7. _visit an atom-smasher at the University.
_play games in a recreation park.

_much_somewhat_slightly

8. _visit a session of the state legislature at Sacramento
_watch animals in the zoo.

_much_somewhat_slightly

9. _play games in a recreation park.
_watch animals in the zoo.

_much_somewhat_slightly

10. _visit a session of the state legislature at Sacramento.
_play games in a recreation park.

_much_somewhat_slightly

11. _visit a session of the state legislature at Sacramento.
_visit an atom-smasher at the University.

_much_somewhat_slightly

12. _visit an atom-smasher at the University
_watch animals in the zoo.

_much_somewhat_slightly

C. When I have finished school and get a job, I'd rather

13. _work in a scientific laboratory.
_be a salesman.

_much_somewhat_slightly

14. _work in a scientific laboratory
_teach school.

_much_somewhat_slightly

15. _be a salesman.
_teach school.

_much_somewhat_slightly

16. _work in a scientific laboratory.
_be a musician.

_much_somewhat_slightly

17. _teach school.
_be a musician.

_much_somewhat_slightly

18. _be a salesman.
_be a musician.

_much_somewhat_slightly

D. When I watch TV I'd rather listen to

19. _music.
_a news commentary.

_much_somewhat_slightly

20. _a news commentary.
_a comedy.

_much_somewhat_slightly

21. _a science program.
_a news commentary.

_much_somewhat_slightly

22. _a science program.
_a comedy.

_much_somewhat_slightly

23. _a comedy.
_music.

_much_somewhat_slightly

24. _music.
_a science program.

_much_somewhat_slightly

E. On Sunday morning I'd rather

25. _meet with a club.
_visit a church that I didn't know anything about.

_much_somewhat_slightly

26. _ride a bicycle.
_meet with a club.

_much_somewhat_slightly

27. _visit a church that I didn't know anything about.
_ride a bicycle.

_much_somewhat_slightly

28. _build something with an erector set.
_ride a bicycle.

_much_somewhat_slightly

29. _meet with a club.
_build something with an erector set.

30. _visit a church that I didn't know anything about.
_build something with an erector set.

_much_somewhat_slightly

F. When I have finished school and get a job, I'd rather be

31. _an airplane pilot.
_a judge.

_much_somewhat_slightly

32. _a judge.
_a scientist.

_much_somewhat_slightly

33. _a banker.
_an airplane pilot.

_much_somewhat_slightly

34. _a scientist.
_an airplane pilot.

_much_somewhat_slightly

35. _a judge.
_a banker.

_much_somewhat_slightly

36. _a scientist.
_a banker.

_much_somewhat_slightly

G. During a rain storm I'd rather

37. _watch the rain.
_see what the barometer does.
_much_somewhat_slightly

38. _watch the rain.
_watch how other people feel about it.
_much_somewhat_slightly

39. _play hide-and-seek.
_watch the rain.
_much_somewhat_slightly

40. _watch how other people feel about it.
_see what the barometer does.
_much_somewhat_slightly

41. _play hide-and-seek.
_watch how other people feel about it.
_much_somewhat_slightly

42. _play hide-and-seek.
_see what the barometer does.
_much_somewhat_slightly

H. If we went to visit a big steel factory, I'd rather

43. _watch the blast furnaces.
_find out how people are chosen for their jobs.
_much_somewhat_slightly

44. _find out how much money people make.
_find out how people are chosen for their jobs.
_much_somewhat_slightly

45. _find out how much money people make.
_watch the blast furnaces.
_much_somewhat_slightly

46. _find out how steel is hardened.
_find out how people are chosen for their jobs.
_much_somewhat_slightly

47. _find out how steel is hardened.
_find out how much money people make.
_much_somewhat_slightly

48. _find out how steel is hardened.
_watch the blast furnaces.
_much_somewhat_slightly

I. When our class gives a play I'd rather

49. _hook up and run the lights.
_choose the play.
_much_somewhat_slightly

50. _choose the play
_work on costumes or scenery.
_much_somewhat_slightly

51. _choose the play.
_show people to their seats.
_much_somewhat_slightly

52. _show people to their seats.
_work on costumes or scenery.
_much_somewhat_slightly

53. _show people to their seats.
_hook up and run the lights.
_much_somewhat_slightly

54. _work on costumes or scenery.
_hook up and run the lights.
_much_somewhat_slightly

J. The school activity I prefer is

55. _"sharing".
_arithmetic.

_much_somewhat_slightly

56. _social studies.
_"sharing".

_much_somewhat_slightly

57. _art.
_arithmetic.

_much_somewhat_slightly

58. _"sharing".
_art.

_much_somewhat_slightly

59. _art.
_social studies.

_much_somewhat_slightly

60. _arithmetic
_social studies

_much_somewhat_slightly

K. When I have finished high school I'd rather

61. _go directly to a four-year college or university.
_get a job right away.

62. _much_somewhat_slightly

62. _get a job right away.
_go to a trade school

_much_somewhat_slightly

63. _go to a trade school.
_go directly to a four-year

_much_somewhat_slightly

64. _go to a junior college.
_go directly to a four-year college or university.

_much_somewhat_slightly

65. _get a job right away
_go to a junior college

_much_somewhat_slightly

66. _go to a trade school.
_go to a junior college.

_much_somewhat_slightly

L. My mother

67. _had some grade school
_finished grade school
_had some high school
_finished high school
_had some college
_graduated from college
_had some post-graduate work
_completed a graduate degree (M.D., Ph.D.)

68. was born in

________________________

69. has lived in California about

_ 0 - 4 years
_ 5 - 9 years
_10 - 14 years
_15 - 19 years
_20 - 24 years
_over 25 years

70. _is a housewife
_works part time
_works full time

________________________

M. My father

71. __had some grade school
__finished grade school
__had some high school
__finished high school
__had some college
__graduated from college
__had some post-graduate work
__completed a graduate degree (M.D., Ph.D.)

72. was born in

________________________

73. has lived in California about

__ 0 - 4 years
__ 5 - 9 years
__10 - 14 years
__15 - 19 years
__20 - 24 years
__over 25 years

74. __works for wages or salary
__is self-employed
__is retired
__is deceased

75. his job or occupation is (or was)

________________________

________________________

N. About myself

76. __Things I do almost every day are

__read books
__work for money--baby-sitting, paper route, or the like (not for my parents)
__watch TV or listen to the radio
__play sports
__play with friends
__go fishing, boating or hiking
__do homework
__do crafts--woodwork, sewing, gardening
__music or art

(Put two checks in front of the thing you like best.)

77. The way I usually feel about going to school is that

__I like it.
__I don't like it.

__much__somewhat__slightly

78. My race is

__Negro
__Oriental
__White

79. __My religion is

__Catholic
__Jewish
__Baptist
__Methodist
__Lutheran
__Presbyterian
__Episcopalian
__Congregationalist
__Unitarian
__some other religion

________________________

80. During the last four weeks I have gone to church

__not at all
__once
__twice
__three times
__four times
__more than four times

81. The job or occupation I would like to have when I am all through with school is

________________________

________________________

B-44

UNIVERSITY OF CALIFORNIA

School of Education
Berkeley 4, California

April, 1953

## ELEMENTARY SCHOOLS

Dear Mr. ________________:

## Questionnaire to Parents

A survey is being conducted in the Berkeley Public Schools with the approval of the Board of Education and the Berkeley school administrators. Your child ____________________, was selected in the sample to be studied. We should like you to give us your opinions on some current educational problems. The information you provide will be kept in strict confidence. Knowledge of parents' views is needed by those who prepare school programs.

Please check your opinions on the blanks below. (Any additional comments you may wish to make in the margins or on the back of this sheet will be welcome.)

1. Should elementary school reports to parents show how well their children are doing in each subject by letter grades (A, B, C, D, and F)?

   ___yes
   ___no, I prefer the present way of reporting to parents

2. About how much schooling do you think most young men need these days to get along well in the world?

   ___some high school
   ___graduate from high school
   ___some college or junior college
   ___graduate from a four-year college

3. Which of these subjects do you think should not be taught in high school?

   ___driver training
   ___art
   ___cooking (for girls)
   ___physical education
   ___foreign languages

4. Here are some attitudes which many people have toward study programs for adults. With which do you agree?

   ___The ordinary man just hasn't time or energy after a hard day's work to educate himself further.
   ___If we don't continue to read and study all of our lives we may grow dull and narrow.
   ___A little practical experience is worth all the books put together.
   ___I'm not interested in hearing a lot of arguments with which I don't really agree.

5. What is your occupation?

   ______________________________

   ______________________________

Would you please fold this questionnaire, place it in the enclosed stamped envelope, and drop it in a mailbox. We hope you will find it convenient to complete this form promptly and return it to us because if any of those parents whom we have selected at random in the sample fail to reply, our results may not be representative of the parents of Berkeley school children.

Thank you very much for your cooperation.

/s/ T. Bentley Edwards

B-45

UNIVERSITY OF CALIFORNIA

School of Education
Berkeley 4, California

April, 1959

Dear Mr. __________________:

A survey is being conducted in the Berkeley Public Schools with the approval of the Board of Education and the Berkeley school administrators. Your child, ______________________, was selected in the sample to be studied. We should like you to give us your opinion on some current educational problems. The information you provide will be kept in strict confidence. Knowledge of parents' views is needed by those who prepare school programs.

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   ___some high school
   ___graduate from high school
   ___some college or junior college
   ___graduate from a four-year college

3. Which of these subjects do you think should not be taught in high school?

   ___driver training
   ___art
   ___cooking (for girls)
   ___physical education
   ___foreign languages

4. Here are some attitudes which many people have toward study programs for adults. With which do you agree?

   ___The ordinary man just hasn't time or energy after a hard day's work to educate himself further.
   ___If we don't continue to read and study all of our lives we may grow dull and narrow.
   ___A little practical experience is worth all the books put together.
   ___I'm not interested in hearing a lot of arguments with which I don't really agree.

5. What is your occupation?

   ______________________________

   ______________________________

Would you please fold this questionnaire, place it in the enclosed stamped envelope, and drop it in a mailbox. We hope you will find it convenient to complete this form promptly and return it to us because if any of those parents whom we have selected at random in the sample fail to reply, our results may not be representative of the parents of Berkeley school children.

Thank you very much for your cooperation.

/s/ T. Bentley Edwards

# BRITISH SCHOOLS

## Inventory Used With Students

## BRITISH SCHOOL STUDY

### Questionnaire for Students

You are being requested to cooperate in a research study being conducted at the University of California Berkeley into the relations between students' attitudes toward a variety of topics and their school, recreational, and occupational interests. The information you provide will be held in strict confidence.

You are asked to give your personal opinions about many statements. There are no "right" or "wrong" answers. If you have difficulty deciding on some items, mark the answer which seems closest to what you believe even though you may have doubts. It is important to mark every item.

There is no time limit, but you are expected to finish in less than an hour, so do not spend too long on any one item.

Fill in the blanks below, then turn the page and begin reading the statements and marking your answers.

NAME____________________________ DATE__________
(Last) (First) (Initial)

SEX______ BIRTH DATE________________ FORM__________
(M or F)

SCHOOL____________________________ CITY__________

**DIRECTIONS:** Underneath each statement below, place a check before the answer that corresponds most closely with your attitude toward the statement. (Pay no attention to the extra numbers in the margins--they are for "coding" purposes.)

---

1-4.

5. 1

6. I am more interested in finding out how TV has affected people's taste than in finding out how TV works.
   1. ___strongly agree
   2. ___moderately agree
   3. ___slightly agree
   4. ___slightly disagree
   5. ___moderately disagree
   6. ___strongly disagree

7. If I were employed by a company manufacturing chemicals, I would rather stay in research than become a company executive, so long as the loss in pay was not too great.
   1. ___strongly agree
   2. ___moderately agree
   3. ___slightly agree
   4. ___slightly disagree
   5. ___moderately disagree
   6. ___strongly disagree

8. I find painting interesting when I am able to see how they represent the artists' attitudes toward life.
   1. ___strongly agree
   2. ___moderately agree
   3. ___slightly agree
   4. ___slightly disagree
   5. ___moderately disagree
   6. ___strongly disagree

9. The opinion of friends helps more than reading in making up my mind.
   1. ___strongly agree
   2. ___moderately agree
   3. ___slightly agree
   4. ___slightly disagree
   5. ___moderately disagree
   6. ___strongly disagree

10. I enjoy swimming in the ocean by myself, or, for safety, with a companion or life guard, more than swimming in a pool.
    1. ___strongly agree
    2. ___moderately agree
    3. ___slightly agree
    4. ___slightly disagree
    5. ___moderately disagree
    6. ___strongly disagree

11. School mathematics courses should concentrate more on practical consumer and business training.
    1. ___strongly agree
    2. ___moderately agree
    3. ___slightly agree
    4. ___slightly disagree
    5. ___moderately disagree
    6. ___strongly disagree

12. Fabulous machines are used to calculate insurance rates. However, data must be fed into the machines. The interviewing techniques for collecting data interest me more than an explanation of how the machines work.
    1. ___strongly agree
    2. ___moderately agree
    3. ___slightly agree
    4. ___slightly disagree
    5. ___moderately disagree
    6. ___strongly disagree

13. Medical experiments using live animals are cruel and inhuman.
    1. ___strongly agree
    2. ___moderately agree
    3. ___slightly agree
    4. ___slightly disagree
    5. ___moderately disagree
    6. ___strongly disagree

14. I never worry about how things are going to work out--they usually seem to take care of themselves.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

15. When I'm watching a movie I sometimes lose track of the plot because I'm wondering how the lighting and stage effects are worked.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

16. I like to ride alone. The feel of a good horse under me, his strength and his rhythm, more than make up for the lack of fellow riders.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

17. I would rather teach science than do research.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

18. Car racing would be fun if you didn't have to know about and work on motors.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

19. I should rather organize the social functions at the school than be selected as an honor student in science.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

20. I think I should enjoy the poem Morte D'Arthur more if it were told as a love story in modern prose.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

21. In our complex industrial civilization a young person should specialize early and stick to it.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

22. I prefer chess to draughts.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

23. Sailing on a boat would be fun with a group of people, but I don't think I'd care much for it by myself.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

24. When talking with my friends in the evening I'd rather talk about people we know and have fun with than talk about religion or philosophy.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

25. To my way of thinking, the need to keep a city beautiful to look at is the most important argument in favor of smog control.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

26. The forces of nature are subjects for wonder and awe--not analysis.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

27. I usually like to do math problems alone rather than discuss them with others.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

28. In a history course I would rather have the reasons why the U.S. didn't join the League of Nations explained to me than try to figure it out.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

29. I would rather go sailing by myself than watch a football game.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

30. It's a sloppy sailor who'll let his sails flap while he basks in the sun and breathes the crisp salty wetness of the air; the keen sailor watches the wind, studies the tides, and understands details of the rigging.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

31. The foreign policy of our government should be based on high moral principles even though this may entail a loss of strategic power or prestige.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

32. Visiting a foreign country I would want to see the pageantry and architecture so I would not be interested in knowing in advance about their customs and history.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

33. Scientists destroy much of the beauty of nature when they explain away its mysteries.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

34. Art should be appreciated intuitively. Analysis destroys its beauty.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

35. I would rather study algebra than history even though algebra seems to be almost totally unrelated to any other subject.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

36. When I'm studying math or science it is refreshing to take frequent breaks watching TV or talking with a friend.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

37. I should prefer to be a machinist rather than a salesman.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

38. I never wonder how the time is going when I'm painting a room or sawing firewood like I do when I'm studying maths or physics.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

39. If pay, housing, etc., were equal I should like the work of a forest ranger better than that of a minister.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

40. I am more interested in following newspaper reports on the recent discoveries regarding "negative matter" than on the developments in racial integration in the schools.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

41. I should prefer the live theater to movies if they were the same price.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

42. I spend more of my free time on hobbies like stamp collecting, woodwork, etc., than going to parties or entertaining friends.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

43. When I was little I liked meccano sets more than tops.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

44. I frequently think about the reasons for other people's misbehavior instead of reacting with irritation.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

45. I should rather read and be able to understand William Shakespeare's Hamlet than Michael Faraday's Experimental Researches in Electricity.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

46. I can visualize myself reading a paper to a scientific society meeting but not chatting socially in the corridor while a meeting is in progress.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

47. Instead of developing expensive tastes, what I would like most to get from my education is either a purpose for my life or an affirmation of my present purposes.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

48. Abilities of sign writers are different from the abilities of men who run a sign business. If I had the ability to do either, I would rather learn to run the business than paint the signs.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

49. I like history and civics much better than science and mathematics.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

50. Science has definitely not been able to show that colored races are inferior to white races.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

51. I don't like being interrupted while I'm doing laboratory experiments by friends who feel like talking.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

52. A person should throw himself into life with vitality--the scientist's reflection on how things work is a wet blanket on the spontaneous pleasures of affection.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

53. If I were a musician the thing I should like best about it would be getting across to the audience the basic idea of the composer.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

54. In studying about the building of the pyramids, I should be more interested in the engineering feat than in the class structure and economy of Egypt which made such magnificent display possible.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

55. I like Dixieland jazz better than "rock and roll".
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

56. A businessman should make his decisions strictly according to the interests of his business. He should not worry about what happens nationally to wages and prices.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

57. Because they need to get close to life, artists are entitled to special consideration if they treat lightly the ties of marriage.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

58. I would sooner have a big living room for parties than have a workroom for hobbies.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly diagreee
5. ___moderately disagree
6. ___strongly disagree

59. When I see an article about "electronic brains" I am more interested in finding out how they work than what their uses are.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree.
6. ___strongly disagree

60. When I am buying clotes I pay less attention to the ones that don't show than to the ones that do show.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

61. When you go on a motor car trip it is much more fun to pick places to stay as you go along rather than booking in advance.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

62. I should rather take a workshop course than a world history course.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

63. I would rather be known as the writer of a social column published in many papers than as the Director of an astronomical observatory.
    1. ___strongly agree
    2. ___moderately agree
    3. ___slightly agree
    4. ___slightly disagree
    5. ___moderately disagree
    6. ___strongly disagree

64. If I had an hour to wait for a train I should more likely read a scientific magazine than one that consisted chiefly of essays.
    1. ___strongly agree
    2. ___moderately agree
    3. ___slightly agree
    4. ___slightly disagree
    5. ___moderately disagree
    6. ___strongly disagree

65. An impulsive person is warm and sincere; one who analyzes his emotions is cold and "phony".
    1. ___strongly agree
    2. ___moderately agree
    3. ___slightly agree
    4. ___slightly disagree
    5. ___moderately disagree
    6. ___strongly disagree

66. Chemistry experiments are fun to watch so long as there are plenty of explosions and color changes.
    1. ___strongly agree
    2. ___moderately agree
    3. ___slightly agree
    4. ___slightly disagree
    5. ___moderately disagree
    6. ___strongly disagree

67. I prefer a science class that is run along fairly formal lines so that I can avoid the distractions arising from personal entanglements with other members of the class.
    1. ___strongly agree
    2. ___moderately agree
    3. ___slightly agree
    4. ___slightly disagree
    5. ___moderately disagree
    6. ___strongly disagree

68. A girl should wear jerseys and "pearls" or whatever most of the girls are wearing rather than conspicuous handmade jewelry.
    1. ___strongly agree
    2. ___moderately agree
    3. ___slightly agree
    4. ___slightly disagree
    5. ___moderately disagree
    6. ___strongly disagree

69. Nobody should be allowed to cut down the redwood forests and turn them into timber.
    1. ___strongly agree
    2. ___moderately agree
    3. ___slightly agree
    4. ___slightly disagree
    5. ___moderately disagree
    6. ___strongly disagree

70. Sometimes when a fellow is out with the crowd, he pretty well has to do a few things he knows he really shouldn't.
    1. ___strongly agree
    2. ___moderately agree
    3. ___slightly agree
    4. ___slightly disagree
    5. ___moderately disagree
    6. ___strongly disagree

71. If I were interested in studying flowers, I should be attracted chiefly by the beauty of the flowers. Comparing the structure of different kinds of flowers would not interest me much.
    1. ___strongly agree
    2. ___moderately agree
    3. ___slightly agree
    4. ___slightly disagree
    5. ___moderately disagree
    6. ___strongly disagree

72. If I had the necessary athletic prowess I should prefer to excel in the cross-country marathon than in football.
    1. ___strongly agree
    2. ___moderately agree
    3. ___slightly agree
    4. ___slightly disagree
    5. ___moderately disagree
    6. ___strongly disagree

73. In science fiction stories, I like the ones with interesting scientific theories that hang together, even if they're not completely true, better than those about the social problems of space settlements.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

74. I enjoy working hard at a science project even if others don't recognize my accomplishment.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

75. I like to watch a big house afire.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

76. Mercy killing should be legalized for cases of extreme suffering where there is no hope for cure.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

77. When I look at the stars at night I sometimes meditate on the way the universe works.
1. ___strongly agree
2. ___moderately agree
3. ___slightly agree
4. ___slightly disagree
5. ___moderately disagree
6. ___strongly disagree

(Go right on to the next column.)

1-4.

5. 2

6. The way I usually feel about going to school is that--
1. _I like school very much
2. _I like school somewhat
3. _I like school slightly
4. _I dislike school slightly
5. _I dislike school somewhat
6. _I dislike school very much

7. The subject from the following list that I have liked best is--
1. _English
2. _Mathematics
3. _Woodwork, sewing, metalwork, cooking, etc.
4. _Foreign language
5. _Science
6. _History
7. _Art
8. _Music

8. The subject from the list above that I have liked least is number--
_____.

9. Things I do almost every day are--
1. _read books
2. _work for money (not from my parents)
3. _watch TV or listen to the wireless
4. _play sports
5. _play with friends
6. _go fishing, boating, or hiking
7. _do homework
8. _do crafts--woodwork, sewing, gardening
9. _music or art

10. The school activities--clubs, teams, etc., that I have participated in this year at school are--

________________________________

________________________________

________________________________

________________________________

11. Are there any other activities or hobbies that occupy a good deal of your free time that you haven't mentioned above?

________________________________

________________________________

________________________________

________________________________

12. When I have finished school, I'd rather--
    1. ___get a job right away
    2. ___go to a technical or trade school
    3. ___go to the university

13. The job or occupation that I should like to have when I am all through with school is--

________________________________

________________________________

________________________________

________________________________

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## ELEMENTARY SCHOOLS

## Sociometric Inventory

## Sociometric Inventory

Teacher's Name
Grade
Name of School

Name____________________________

| | 1 | 2 | 3 |
|---|---|---|---|
| Mary Jones | | | |
| John Smith | | | |
| . . . | | | |
| . . . | | | |
| | | | |

82. _he likes school.
_he doesn't like it.

_much_somewhat_slightly

83. _get a job.
_go to a trade school.
_some college or junior college.
_go to a four-year college or university.

84. _some high school.
_graduate from high school.
_some college or junior college.
_graduate from a four-year college.

85. ____________________________

____________________________

# PANEL STUDY

## Interview Schedule

## Final Form

PRECEDING PAGE BLANK- NOT FILMED

Record position__________

(IF NO, EXPECTATION DIFFERS FROM ASPIRATION):

Why don't you think you'll be able to do what you most want to do--to be a . . .?

Suppose you had no other choice, which of these would you rather be? An airplane pilot, a judge, a scientist, or a banker? (GIVE CARD TO S.) Which job would you like best?

Why do you think you'd like that job?

Which would be your second choice?

Which would be your third?

Among these jobs, now, which would you rather do? Work in a scientific laboratory, be a salesman, teach school, or be a musician? (SHOW REVERSE SIDE OF CARD TO S.) Which of these would you like best?

What would you like about that job?

Which would be your second choice among these?

And which would be your third choice?

p. 2. Ident. No. __________

V/13. PERSONAL EXPERIENCE
1. considerable--relevant
2. considerable--remote
3. some
4. very little
5. none (DK)
0. n. e. c.
y. NA

V/14. ROLE MODEL
1. Father
2. Teacher
3. Adult--personally acquainted
4. Adult--not known personally
5. None (DK)
0. n. e. c.
y. NA

V/15. CERTAINTY
1. positive, very sure
2. fairly sure, would like to, etc.
3. uncertain (DK)
y. NA

V/16. PREPARATIONAL PLANS
1. cogent, realistic
2. vague
3. unrealistic (DK)
0. n. e. c.
y. NA

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

(OBSERVATION ONLY, MARK):

V/17. ETHNIC IDENTIFICATION
1. Negro
2. Oriental
3. White
4. Mexican
0. Other (__________)
y. Not determinable

V/18-19. OCCUPATIONAL EXPECTATIONS
(See code of occupational categories.)
1-1. Same as aspiration

V/20. REASON FOR DISCREPANCY
1. lack of ability
2. lack of opportunity
3. parental objections
0. n. e. c.
x. DK
y. NA

V/21. PREFERRED FORCED CHOICE
1. P: judge
2. T: scientist
3. A: pilot
4. I: banker
x. DK

V/22. REASON FOR PREFERENCE
(Same code as V/10.)

V/23. PREFERRED FORCED CHOICE
1. P: teach school
2. T: scientific laboratory work
3. A: musician
4. I: salesman
x. DK

V/24. REASON FOR PREFERENCE
(Same code as V/10.)

Record position ________

Are you living with your parents--your father and mother?

What does your father do?

(FATHER'S OCCUPATION):

(PERM. REC.________________________)

(STUDENT, '59________________________)

(PARENT, '59________________________)

Does he like his job?

What does he like (dislike) about it?

Does he ever talk about his job when he comes home?

What does he say about it?

Has he ever talked with you about what you might do when you're grown up?

Does he do things with you on the week-end?

What do you do together? About how often?

What does your father do in his free time?

Does your father spend much time reading?

What kinds of things does he read?

About how many books do your parents own?

How far did your father go in school?

How sure are you of that?

How close are you to your father?

What is there about him that you admire most?

Would you like to be like him when you're grown up?

p. 3. Ident. No. ________

**V/25. HOME SITUATION**

1. mother and father
2. mother and step-father
3. mother only
4. step-mother and father
5. related guardians (e.g., uncle & aunt)
0. n. e. c.

**V/26-27. FATHER'S OCCUPATION**

(See code of occupational categories.)

**V/28. FATHER'S ATTITUDE TOWARD JOB**

1. enthusiastic
2. satisfied
3. doesn't talk about it
4. dislikes it
0. n. e. c.
x. DK

**V/29. FATHER'S ATTITUDE TOWARD S's OCCUPATIONAL ASPIRATIONS**

1. strong support
2. approval
3. never discussed it, DK attitude
4. indifference
5. disapproval
0. n. e. c.

**V/30. FATHER-SON ACTIVITIES**

1. every week-end or more
2. 2 or 3 per month
3. 1 per month or less
4. never
x. not determinable

**V/31. FATHER'S LEISURE ACTIVITIES (m.p.)**

1. serious reading
2. light reading (e.g., mysteries, SF, etc.)
3. politics, community activities
4. social (immediate)
5. outdoor, athletics
6. art, music
7. TV, radio, movies
8. theater, concerts
9. crafts
0. n. e. c.
x. DK

Record position_________

What subject do you like best in school?

What is it about . . . that you like?

What subject do you like least--do you dislike?

What do you dislike about . . .?

Do you think it is important to study hard in school?

Why?

Do you think what you do in school now will make any difference to you in later life?

Is it important to get good grades in school?

Do you learn anything in school that's going to help you be a . . .?

* * *

What kind of boys do your teachers like to have in class?

How do they want boys to act?

Do you like boys like that?

Are you that kind of boy yourself?

What do you think your teachers think of you?

How much does it matter--a lot, some, or not much?

Are you friendly with any particular teacher?

Tell me about him. What sort of a person is he?

What does he teach?

What do you like about him?

Do you think he likes teaching school?

Does he seem happy--interested in what he is doing?

p. 4. Ident. No._________

**V/32. PARENTS' BOOKS**
1. none
2. 1-9
3. 10-24
4. 25-49
5. 50-99
6. 100-199
7. 200 or more
x. DK

**V/33. FATHER'S EDUCATION**
1. 0-7
2. 8
3. 9-11
4. 12 (HS graduate)
5. 13-15
6. 16 (college graduate)
7. 17-18
8. 19 + (ph.D., M.D.)
x. DK

**V/34. CERTAINTY**
1. positive, certain
2. fairly sure
3. only guessing
y. NA (V/33: x)

**V/35. IDENTIFICATION WITH FATHER**
1. strong admiration and desire to emulate
2. admiration with reservation
3. indifferent, not close--salient
4. desire to be different
5. strong negative feelings
0. n. e. c.
x. not determinable

**V/36. FAVORITE SUBJECT**
1. science
2. arithmetic--incl. problem-solving
3. arithmetic comp.
4. spelling
5. language, grammar
6. reading, English literature
7. foreign language
8. social studies, history
9. art or music
0. shop, mech. drawing
x. DK, none
y. other, n. e. c.

Record position________

P. 5. Ident. No. ________

Have you ever become so interested in something a teacher has talked about that you've gone out and read about it on your own?

(IF YES):
What was that about?

What did you read (or do)?

Are you still interested in that?

(IF NO):
Why do you think you haven't?

Do teachers ever say anything that really interests you?

What are you really interested in, now?

* * * * * * * * * * * * * * * * * * * * * * * * *

V/37. LEAST LIKED SUBJECT
(Same code as V/36.)

V/38. ORIENTATION IMPLICIT IN REASONS FOR SUBJECT PREFERENCES
1. prudent
2. theoretic
3. aesthetic
4. immediate
0. n. e. c.
x. not determinable
y. NA (e.g., V/36-37: x)

V/39. IMPORTANCE OF SCHOOL WORK (m.p. if different reasons are of equal importance to S.)
1. not important
2. instrumental for educ. & occup. asp.
3. gain parental approval
4. teacher's approval
5. peers' approval
6. social respectability --proper grammar, manners etc.
7. develops talents; "makes you smarter" (if valued in itself)
8. expands interests and tastes.
9. intrinsic interests of subject-matter
0. n. e. c.

* * * * * * * * * * * * * * *

V/45. EDUCATIONAL ASPIRATIONS
(Same code as V/33.)

V/40. TEACHER'S MODEL
1. behavioral docility, conformity--quiet, follow rules, etc.
2. social competence or sportsmanship
3. academic competence
4. intellectual liveliness, interests
0. n. e. c.
x. DK, refused

V/41. S's ATTITUDE TOWARD TEACHER'S MODEL
1. approve, like
2. indifferent
3. dislike
0. n. e. c.
x. DK, refused
y. NA (V/40: x.)

V/42. PERSONAL SALIENCY
1. yes, much
2. yes, some
3. yes, not much
4. no, but cares much
5. no, some
6. no, doesn't care
x. DK, refused
y. NA (V/40-41: x, y.)

V/43. ATTRIBUTES OF FAVORITE TEACHER
1. no favorite teacher
2. fair (in distributing rewards and punishments)
3. kind, cheerful, etc. ("LTC")
4. athletic (or interest in sports)
5. academic competence and/or intellectual stimulation
0. n. e. c.
x. DK

V/44. AROUSED INTERESTS
1. never interested
(INTEREST NOT PURSUED)
2. science or math.
3. social studies
4. literature, writing
5. other, n. e. c.
(INTEREST PURSUED--NOT FOR GRADES OR REWARD)
6. science or math.
7. social studies
8. literature, writing
9. other, n. e. c.

V/46. COLLEGE MAJOR
1. engineering
2. science, math.
3. social sciences
4. pre-med.
5. law, poli. sci.
6. business admin.
7. educ., soc. welfare
8. other professional
9. humanities
0. n. e. c.
x. DK
y. NA (non-college)

Record position ________ p. 6. Ident. No. ________

(IF EDUCATIONAL ASPIRATIONS NOT CLEARLY INDICATED IN PREPARATION FOR JOB, ABOVE):

How far do you want to go in school?

Would you leave school now if you could?

Do you want to finish high school?

Would you like to go to college?

(IF NON-COLLEGE):

Why do you want to leave school then?

What do you think about going to college?

Why aren't you interested?

(IF COLLEGE):

Why do you want to go to college?

Where did you get the idea you'd like to go to college?

What subject area would you like to specialize --major--in?

Do you have any idea what college you'd like to go to?

Do you think you have the ability to go through college?

Do you expect that you will actually graduate from college eventually?

What kind of boys are most popular in school here?

What's more important for being popular here, being a good athlete, a good student, or having a nice personality?

Do most of the boys admire a person who is a good student, or do they think good students are "squares"?

How would you "rate" yourself? Are you very popular with the boys?

(IF NO):

Would you like to be?
Do you try to act like the most popular boys?

V/47. REASONS FOR COLLEGE

1. occupational training, increased income
2. social life, contacts
3. athletics
4. moral or religious
5. general education, appreciation of ideas, whet intellect, etc.
0. n. e. c.
x. DK
y. NA, non-college

V/48. REASONS AGAINST COLLEGE

1. lack of ability
2. lack of money
3. not useful, practical
4. not interested in school--subject-matter
0. n. e. c.
x. DK, refused
y. NA, college

V/49. SOURCE OF COLLEGE ASPIRATIONS

1. father
2. mother
3. teacher(s)
4. peer(s)
5. reading
6. diffuse, "thing to do", "everybody"
0. n. e. c.
x. DK
y. NA, non-college

V/50. COLLEGE CHOICE

1. Univ. of Calif., Berk.
2. Stanford
3. state college
4. class IV, accred.
5. class III, accred.
6. class II, accred.
7. religious
8. non-accredited
9. JC (class I) first,
0. n. e. c.
x. DK
y. NA, non-college

V/51. EDUCATIONAL EXPECTATIONS
(Same code as V/33.)

Record position __________

P. 7. Ident. No. __________

Of all of the boys you know, who do you admire most--who would you like to be like? Tell me about him.

About how many of the boys in your grade at school here do you know well?

In general, how do you think most of them--the boys that you know--feel about school work?

Do they do just what they have to to get by, or do most of them work as hard as they can?

Is that your impression of the other boys also--those you don't know so well?

How far do you think most of the boys want to go in school? Do you think most will want to drop out of high school as soon as they're allowed to, or graduate from high school, or do you think most of them will want to go to college if they are able to?

What sort of teacher do most of the boys like? What do they think a good teacher is like?

Are there some things that teachers do, or expect, that most of the boys dislike--resent?

**V/52. REASON FOR DISCREPANCY**
1. lack of ability
2. lack of money
3. lack of effort
4. discriminatory evaluations
0. n. e. c.
x. DK, refused
y. NA, no discrepancy

**V/53-54. ATTRIBUTES CONTRIBUTING TO POPULARITY**
53: most important;
54: m.p. all, incl. 53
1. athletics
2. scholarship
3. personality
4. family, status
5. dress, fads
6. popularity w. girls
7. non-conformity to adult norms (delinquency, smoking, "daring", etc.
0. n. e. c.
x. DK, refused

**V/55. IMAGE OF SCHOLAR**
1. admired, positive
2. indifference, neutral
3. "square", negative
0. n. e. c.
x. DK, refused

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

**V/56. S's POPULARITY**
1. very popular, "leading crowd"
2. fairly popular
3. not very popular
x. DK, refused

**V/57. SIGNIFICANCE OF PEER NORMS OF POPULARITY**
1. significant--is and/or tries to be popular
2. estranged--does not emulate leading crowd
3. negative--disapproves of leading crowd
0. n. e. c.
x. refused, evasive

**V/58. ADMIRED BOY**
1. same grade and school
2. higher grade, same school

**V/58. (continued)**
3. other Berkeley school
4. not in Berkeley
5. none
0. n. e. c.

**V/59. ATTRIBUTES OF ADMIRED BOY** (m.p.)
(Same code as V/54.)

**V/60. NO. OF WELL-KNOWN CLASSMATES**
1. none
2. few (ten or fewer)
3. less than half of grade
4. more than half
5. almost all
x. cannot determine

**V/61. PEERS ATTITUDE TOWARD SCHOOL WORK**
1. interested, work hard
2. disinterested, work hard
3. disinterested, work little
4. strongly dislike, "hate it"--but work
5. strongly dislike--work little
0. n. e. c.
x. DK, refused

**V/62. IMPRESSION OF UNKNOWN PEERS ATTITUDE TOWARD SCHOOL WORK**
(Same code as V/61.)

**V/63. PEERS EDUC. ASP.**
(Same code as V/33.)

Record position_________

What does your mother do?

Does she enjoy it?

  What does she like (dislike) about her work?

Does she ever talk with you about your schoolwork?

  What does she say?

What about your plans to be a . . . , have you talked with your mother about that?

  What does your mother do in her free time?

Does she spend much time reading?

  What kind of things does she read?

How far did your mother go in school?

  How sure are you of that?

Do you own any books of your own?

  How many?

Are you reading any book now?

  What is its name?

Do you watch TV?

(IF YES):

  How much?

  What are your favorite programs?

(IF NO):

  Do you have a set at home?

    Do neighbors have a set you might watch if you wanted to?

p. 8. Ident No. __________

**V/64. ATTRIBUTES OF POPULAR TEACHER**
(Same code as V/43.)

**V/65. RESENTED TEACHER BEHAVIOR**
1. partiality
2. aloofness, social distance
3. strict discipline
4. lax discipline
5. boredom, lack of interest
6. lack of competence
7. "phony" (intellectual dishonesty)
8. excessive work, homework.
9. no resented attributes (if consistent with other information--otherwise code "x")

0. n. e. c.
x. DK, refused, evasive

**V/66-67. MOTHER'S OCCUP.**
(See code of occupational categories.)

**V/68. MOTHER'S ATTITUDE TOWARD OCCUPATION**
(Same code as V/28.)

**V/69. MOTHER'S ATTITUDE TOWARDS S's SCHOOL WORK**
1. strong pressure for achievement
2. moderate desire for achievement
3. laissez-faire
4. derogates school-work

0. n. e. c.
x. DK

**V/70. MOTHER'S ATTITUDE TOWARD S's OCCUPATIONAL ASPIRATION**
(Same code as V/29.)

**V/71. MOTHER'S LEISURE ACTIVITIES** (m.p.)
(Same code as V/31.)

**V/72. MOTHER'S EDUCATION**
(Same code as V/33.)

Record position________

How about radio, do you listen to the radio (also)?

About how much?

What are your favorite radio programs?

You know, some parents have rules for their children about things like how long they may watch TV, and some parents don't. Do your parents have any rules about?

how long you may watch TV

how long you may listen to the radio

when you must come in at night on weekends

the time you spend doing homework

against going around with certain boys

against going around with certain girls

eating dinner with the family

how far you may go away from home without special permission

Do you date?

How often?

How long have you been dating?

How do you spend your time after school?

Do you go out for athletics?

Do you do homework?

How much?

Do you have any hobbies or interests (that you haven't already mentioned)?

Does someone in your family get a newspaper every day?

Do you look at it?

What parts of the paper do you read regularly?

Who is the Governor of California?

How does he feel about capital punishment?

p. 9. Ident. No. ________

V/73. OWN BOOKS
(Same code as V/32.)

V/74. READING
1. none
2. child's fiction
3. adult light fiction
4. adult serious fiction
5. child's scientific
6. adult technical-scientific
7. political, social science
8. poetry
9. biography
0. n. e. c.
x. cannot determine

V/75. TV TIME
1. none, TV available
2. none, TV unavailable
3. ½-1 hrs./ day
4. 1½-2 hrs./day
5. 2½-3 hrs./day
6. 3½-4 hrs./day
7. 4½+ hrs./day
x. DK, cannot determine

V/76. RADIO TIME
(Same code as V/75.)

V/77. PARENTS' RULES (m.p.)
1. none
2. TV
3. radio time
4. time home
5. homework
6. boy associates
7. girl associates
8. dinner
9. range
0. other, n. e. c.
x. DK, refused

V/78. DATING
1. never, hardly ever
2. 1 per month or less
3. 2-3 per month
4. 1 per week
5. 2-3 per week
6. 4 or more per week
x. DK, refused

Record position________

What are some of the arguments against capital punishment?

What are some of the arguments for it?

How do you feel about it?

Who is the Premier of Cuba?

Who is the British Prime Minister?

Who is Secretary of State of the United States?

Who is the President of France?

(IF DE GAULLE, ASK ABOUT DE GAULLE'S POSITION WITH RESPECT TO THE ALGERIAN CONFLICT.)

Now here is something I'd like you to do. Would you move this cup slowly away from you until you just can't see the coin anymore--until it disappears behind the rim of the cup. Now watch the cup carefully, without moving your head, while I pour this water into it. (POUR WATER.)

What did you see happen?

How do you explain what happened?

(IF ANSWER "ADEQUATE"):

Why might light rays bend when they move from the water into the air?

(IF DK OR "INADEQUATE"):

Let me give you a clue. Look at this straight pencil when I put it into the water. How does it look now?

Which way does it look as though it were bent? Does the part under the water look closer to the surface now, or is it bent down--away from the surfact?

Does this give you any idea why the coin reappeared?

(IF STILL DK OR "INADEQUATE"):

Let me draw a sketch of what happened. Here is an outline of the cup with the coin at the bottom. (DRAW SKETCH.) When you see a thing, rays of light are coming from that thing to your eye. That's what causes you to see it. Now when you first pushed the cup away from you, you were just unable to see the coin, so the rays of light were coming to your eye

p. 10. Ident. No.________

VI/1-4. IDENT. NO. ________

VI/5. DECK NO. 6

VI/6. AFTER SCHOOL ACTIVITIES (m.p.)

1. athletics
2. reading
3. homework
4. music, art, dance--lessons, etc.
5. TV, radio, movies
6. immediate--social
7. outdoor--fishing
8. theoretic--electronics, chemistry
9. aesthetic--stamps, collections, etc.

0. n. e. c.

x. DK, none, refused

VI/7. NEWSPAPER (m.p.)

1. none available
2. available, doesn't read any
3. comic strips
4. sports
5. headlines
6. front page news
7. editorials

0. n. e. c.

x. refused

VI/8. CURRENT EVENTS

1. 4 or 5 names, good grasp of Algerian situation and capital punishment issues
2. 4 or 5 names, poor knowledge or Algerian situation and/or capital punishment issues
3. 2 or 3 names, good grasp of Algerian situation and/or capital pun. issues
4. 2 or 3 names, poor knowledge of Algerian sit. and cap. pun. is.
5. 1 name
6. no names

Record position ________

(IF STILL DK OR "INADEQUATE")--Continued:

like this. (ADD ARROW AND EYE TO SKETCH.) The light rays from the coin bumped into the side of the cup so they couldn't reach your eye. But when I poured water into the cup, (DRAW SURFACE LINE OF WATER.) light rays from the coin somehow managed to get to your eye. What did those light rays have to do in order to get to your eye?

(EXPLAIN OR RESTATE "SOLUTION" TO ALL):

Light rays usually go in a straight line, but when they move from one substance to another--like from water into the air--they'll change direction. Now if you were skindiving in clear water, and looked up and saw a person on the bank above you, would he seem to you to be in the right place, or higher, or lower than he really was?

Why?

(THE EXPLANATION, RATHER THAN THE INITIAL RESPONSE, COUNTS IN SCORING APPLICATION. ALLOW S TO USE SCRATCH PAPER IF HE CAN'T ARTICULATE EXPLANATION, AND TO REVERSE HIS ANSWER IF HE SEES THE CORRECT ANSWER FROM HIS OWN EXPLANATION OR SKETCH.)

VI/9. SCIENCE EXPERIMENT

1. correct ("light bends") answer, correct (changes speed) or other ingenious explanation, correct application
2. correct answer and application
3. correct answer elicited by pencil in water, correct application
4. correct answer elicited by explanation and sketch, correct application
5. correct answer immediately or after pencil clue, but cannot apply
6. correct answer elicited by explanation and sketch, but cannot apply
7. correct answer never elicited

Thank you very much. I have enjoyed our conversation.

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

# DETAILED DESCRIPTION OF OCCUPATIONAL CATEGORIES

**Used Towards the End With**

**All Studies**

## Final Form Used Toward End of Study

## OCCUPATIONAL CATEGORIES

## DETAILED DESCRIPTION

| Code | Title | Description and/or example |
|---|---|---|
| 0 | Executive | High-level administrative positions, e.g., salaried executives, non-elected public administrators, advertising managers, publishers, etc. |
| 0 1 | Executives | |
| 0 2 | Supervisors | Fairly high-level supervisory work. Personnel managers, floor managers, etc. |
| 0 3 | Business specialists | High-level work in business not primarily supervisory in nature; e.g., accountant, credit man, purchasing agent, management consultant. |
| 0 4 | Technical sales worker | Salesmen of highly technical products, requiring considerable training to understand and sell; sales engineers. |
| 0 5 | Armed Forces | Staff officer (major, commander) or higher. |
| 0 y | Administrators n. e. c. | Administrators, supervisors, etc., not elsewhere classified. |
| 9 | Professional, except education | Occupations requiring at least a Bachelor's in some special area--or other highly specialized training, as, for example, a concert pianist. |
| 9 1 | Engineers | All kinds, except when sales work is specifically indicated. (Caution: do not include railroad trainmen, janitors, etc., where title includes the word "engineer".) |
| 9 2 | Natural scientists | Physicists, chemists, geologists, etc. Usually gov't or private industry workers doing research. |
| 9 3 | Biological scientists | Biologists, geneticists, agronomists, etc. |
| 9 4 | Mathematicians | Industrial statisticians, actuaries, gov't or private industry research mathematicians. |
| 9 5 | Social scientists | Gov't and private industry research anthropologists, economists, sociologists, psychologists. |
| 9 6 | Medical professions | Doctors, surgeons, dentists, veterinarians, etc. |

| Code | Title | Description and/or example |
|---|---|---|
| 9 7 | Law and politics | Lawyers, full-time politicians of at least state level, district attorneys, judges, etc. |
| 9 8 | Literature and arts | High-level writers, sculptors, actors, musicians, artists, etc. |
| 9 9 | Religious workers | Ministers, missionaries, etc., at professional level (i.e., trained at college level or higher). |
| 9 0 | | Architect |
| 9 y | Professional persons n. e. c. | General professional not elsewhere classified (n. e. c.). Do not use this classification unless there is a specific indication that the person is at a high professional level. |
| 8 | Professional, education | Same as 9--except that there is a specific indication that the individual is a teacher or in the field of education at least half-time or more. |
| 8 1 | College teaching; engineers | See 9-1. |
| 8 2 | " " nat.sciences | See 9-2. |
| 8 3 | " " biol. sciences | See 9-3. |
| 8 4 | " " mathematics | See 9-4. |
| 8 5 | " " social sciences | See 9-5. |
| 8 6 | " " humanities | Literature, languages, philosophy, speech, etc. |
| 8 7 | " " prof. sch. | Law, medicine |
| 8 8 | " " prof. sch. | Education, social welfare |
| 8 9 | " " n. e. c. | |
| 8 0 | Educational administrators | Principals, superintendents, etc. |
| 7 | Farmers, ranchers: self-empl. | |
| 7 1 | Farm owner-operator | |
| 7 2 | Ranch owner-operator | |

| Code | Title | Description and/or example |
|---|---|---|
| 6 | Merchants: self-employed | |
| 6 1 | Retail store owner | Grocery, variety |
| 6 2 | Wholesale business owner | |
| 6 3 | Export-import business | |
| 6 4 | Broker | Real estate (self-employed) |
| 6 5 | Contractors | (If the individual is himself a craftsman, practicing his trade, then he should be classified as an "artisan", 5-1). |
| 6 6 | Pharmacist, druggist | |
| 6 y | Merchants n. e. c. | E.g., "merchant", with no other information provided. |
| 5 | Artisans: self-employed | |
| 5 1 | Craftsmen | Garage owner-operator, mechanic; carpenter-contractor, jeweler, etc. |
| 5 2 | Service worker | Barber, bartender, restaurant owner. |
| 5 3 | Nursery | Nursery owner, self-employed gardener. |
| 5 y | Self-employed n. e. c. | E. g., "self-employed", with no other information provided, self-employed piano technician. |
| 4 | Upper white collar | |
| 4 1 | High school teaching, math and science | Teaching any H.S. science course, including general science, as long as it is 9th grade or higher. |
| 4 2 | Other teaching, non-college | All non-science H.S. teachers, grade school teachers, nursery school, remedial, etc., teachers. |
| 4 3 | Salesman: non-product | Advertising, insurance, stocks and bonds, etc. |
| 4 4 | Salesman: product or n.e.c. | Selling automobiles, paint, appliances, etc.; real estate (if not self-employed). "Salesman", with no other information provided. |
| 4 5 | Technicians | Draftsmen, radio and radar operators, surveyors, laboratory technicians |

| Code | Title | Description and/or example |
|---|---|---|
| 4 6 | Medical technicians | Nurses, medical and dental technicians. |
| 4 7 | Social welfare | Social welfare workers, psychiatric social welfare workers, probation officers, etc.; city playground directors, etc. |
| 4 8 | Airplane pilots | |
| 4 9 | Armed Forces | "Field grade" officers. |
| 4 y | Upper white collar n.e.c. | Other upper white collar occupations, not elsewhere classified, requiring college or technical training beyond high school. |
| 3 | Lower white collar | |
| 3 1 | Office and clerical | Stenographer, bookkeeper, file cler, cashier, ticket clerk, etc. |
| 3 2 | Retail store clerk | Sales clerks. |
| 3 3 | Driver-salesmen, auctioneers, hucksters, peddlers | Milk, bread, ice-cream, soft-drink, driver-salesmen; newsboys, peddlers. |
| 3 4 | Public servants | Postmen, firemen, policemen |
| 3 5 | Foremen, inspectors | |
| 3 6 | Technical assistants | Nurses' aides, practical nurses, laboratory assistants, etc. |
| 3 7 | Professional athletes | |
| 3 8 | Service workers | Waiters, bartenders. |
| 3 9 | Entertainers, models | Models, bit players, dance band musicians, movie, TV, radio "extras", all entertainers not at a "high cultural level" (9-8). (If status is not determinable, classify as y-8.) |
| 3 0 | Armed Forces | Army master or first sgt.; warrant officer; Navy chief petty officer or warrant-bosun; Coast Guard mate. |
| 3 y | Lower white collar n.e.c. | All non-manual occupations, requiring a high school education or less, not elsewhere classified. |

| Code | Title | Description and/or example |
|---|---|---|
| 2 | Manual workers | |
| 2 1 | Skilled craftsmen | All journeymen: printers, welders, sheet metal workers, electricians, painters, carpenters, radio-TV repairmen, bakers, cooks, etc. |
| 2 2 | Semi-skilled manual workers | Machine operators, crane operators, truck drivers. |
| 2 3 | Unskilled laborers | Janitors, gardeners, mechanics' helpers, hod carriers, construction workers, longshoremen, warehousemen, etc. |
| 2 4 | Farm laborers | |
| 2 5 | Domestic workers | |
| 2 6 | Armed Forces | Staff sgt., or below; non-officer n.e.c. |
| 2 y | Manual worker n. e. c. | |
| x x | Housewife, "homemaker" | (Working less than half-time for wages or salary.) |
| y | Not elsewhere classified | |
| y 1 | Armed Forces | "Army", "Navy", no additional information |
| y 2 | Retired | No additional information. (Code former occupation if available.) |
| y 3 | Ill | No additional information. (Code "usual" or most recent occupation if available.) |
| y 4 | Deceased | No additional information. (Code surrogate's occupation if available; or former occupation of deceased if there is no surrogate, and this information is available.) |
| y 5 | Unemployed | No additional information. (Code "usual" or most recent occupation if available.) |
| y 6 | Parents separated or divorced | No additional information. (Code step-father's or other surrogate's occupation if available.) |
| y 7 | Student | (Attending an educational institution half-time or more; ignore temporary part-time employment.) |
| y 8 | Entertainers n.e.c. | |
| y x | Not elsewhere classified | |
| y y | No information | |

Student Attributes for Which Data Are Available

**CHECK CHART TO SHOW DATA AVAILABLE**

| | Pilot | Bay Area | Berkeley Elementary | British Schools |
|---|---|---|---|---|
| 1. Name | | | X | |
| 2. Sex | X | X | X | X |
| 3. Age | X | X | X | X |
| 4. Race | | X | X | |
| 5. Religion | | X | X | |
| 6. Church going | | X | X | |
| 7. Birthplace | | X | X | |
| 8. School | | X | X | X |
| 9. Grade or form | | X | X | X |
| 10. Teacher | | | X | |
| 11. Father's occup. | X | X | X | X |
| 12. Father's educ. | | X | X | |
| 13. Father's birthplace | | X | X | |
| 14. Mother's occup. | | | X | X |
| 15. Mother's educ. | | X | X | |
| 16. Mother's birthplace | | | X | |
| 17. English spoken in the home | | | X | |
| 18. Length of family residence in Calif. | | X | X | |
| 19. Siblings | | X | | |
| 20. Political party | | X | | |

## Student Attributes for Which Data Are Available

| | Pilot | Bay Area | Berkeley Elementary | British Schools |
|---|---|---|---|---|
| 1. Name | | | X | |
| 2. Sex | X | X | X | X |
| 3. Age | X | X | X | X |
| 4. Race | | X | X | |
| 5. Religion | | X | X | |
| 6. Church going | | X | X | |
| 7. Birthplace | | X | X | |
| 8. School | | X | X | X |
| 9. Grade or form | | X | X | X |
| 10. Teacher | | | X | |
| 11. Father's occup. | X | X | X | X |
| 12. Father's educ. | | X | X | |
| 13. Father's birthplace | | X | X | |
| 14. Mother's occup. | | | X | X |
| 15. Mother's educ. | | X | X | |
| 16. Mother's birthplace | | | X | |
| 17. English spoken in the home | | | X | |
| 18. Length of family residence in Calif. | | X | X | |
| 19. Siblings | | X | | |
| 20. Political party | | X | | |

Data Available

| | Pilot | Bay Area | Berkeley Elementary | British Schools |
|---|---|---|---|---|
| 21. Vocational asp. | X | X | X | X |
| 22. Source of occup. aspirations | X | | | |
| 23. Educational asp. | X | X | X | X |
| 24. Usual feelings about school | | | X | X |
| 25. Favorite subject | | X | X | X |
| 26. Least liked subject | | X | X | X |
| 27. Teach. est. of interest | | | X | |
| 28. Sociometric data | | | X | |
| 29. Spare time activities | | X | X | X |
| 30. Activities in School | | X | | X |
| 31. School office held | | X | | |
| 32. Intelligence quotient | X | X | X | X |
| 33. Standardized scores Reading | | | X | X |
| Arithmetic | | | X | X |
| Chemistry | X | | | |
| Physics | X | | | |
| 34. Teacher marks Social studies | X | X | X | X |
| English | X | X | | X |
| Science | X | X | X | X |
| Arithmetic | | | X | |
| Reading | | | X | |
| Mathematics | X | X | | X |
| Art | | | | X |

Data Available

| | Pilot | Bay Area | Berkeley Elementary | British Schools |
|---|---|---|---|---|
| 35. GCE scores in | | | | |
| English Comp | | | | X |
| Geography | | | | X |
| Latin | | | | X |
| French | | | | X |
| Mathematics | | | | X |
| Physics | | | | X |
| Chemistry | | | | X |
| Biology | | | | X |
| Art | | | | X |
| History | | | | X |
| English Lit | | | | X |
| German | | | | X |
| 36. Reader | | | X | |
| 37. Scale item scores | | | | |
| P-T | X | X | X | X |
| P-A | X | X | X | X |
| P-I | X | X | X | X |
| T-A | X | X | X | X |
| T-I | X | X | X | X |
| A-I | X | X | X | X |

# APPENDIX C

## APPENDIX C--ATTITUDE SCALING

The development and techniques of scaling which have been used in the various phases of this study have been overviewed in Appendix A, and some of the earlier steps have already been reported elsewhere.[1] In this Appendix an effort will be made to pull together salient aspects of these reports and summarize subsequent steps.

Originally a large number of items were written by the authors, on the basis of a priori consideration of content, intended to discriminate between those interested in the natural sciences (called "theoretic"), in the humanities and social sciences (called "prudent"), in proximate social activities and rewards (called "immediate"), and those whose appreciation of experiences was intuitive--i.e., neither deliberative nor social (called "aesthetic"). It was recognized that the particular situation described in any one item might often lead to an expression of a preference which was specific to that item without reflecting any general preference on the part of the respondent for the class of activities. For example, a person might well prefer a chemistry class to a history class because of an aesthetic enjoyment of the laboratory work or because of idiosyncracies of his present teachers rather than because, in general, he prefers natural science to social studies.

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[1] T. Bentley Edwards and Alan B. Wilson, "The Development of Scales of Attitudinal Dimensions," Journal of Experimental Education, XXVIII (September, 1959), 3-36; "Attitudes of High School Students as Related to Success in School: Final Report to the U. S. Office of Education, Department of Health, Education, and Welfare," OE Contract No. SAE 7143 (mimeographed, July 31, 1958), pp. 20-40.

A variety of choices were therefore offered which, at least in the minds of the authors, were associated with the pairs of poles to be contrasted, e.g., "prudent" vs. "theoretic", "prudent vs. "immediate", etc. To oversimplify the statistical manipulations described below, it is assumed that, say, those who express a preference for scientific activities over a large number of alternatives may be more validly and reliably identified as interested in science than were a single such preference solicited.

Both in the original selection of items for use in the scales, and in the subsequent judgement of the adequacy of the scales, the primary criterion was the internal consistency of the items as indicated by the extent to which the pattern of responses to the items of a scale were cumulative--e.g., whether those who chose science over the most popular alternatives would consistently choose science, etc.

## Item Selection

### High school scales

A pool of 180 items, 30 for each of the six scales, cast as statements expressing a preference for one over another of the four poles, were administered to two groups of students for preliminary analysis. One consisted of 92 high school students enrolled in a required biology course, and the other 50 conveniently available students enrolled in undergraduate education courses at the University. Responses to each item were made by checking a six-point forced choice scale indicating reactions from "strongly agree" to "strongly disagree".

The respondents were scored on each of the six scales by summing arbitrary weights, 5-0, for their responses to each item of the scale.

Following Guttman's "Cornell Technique",[1] a table was laid out for each scale for each of the two samples. Each table was constructed with a column for each of the six response categories of each item, and a row for each individual in the sample. Thus, since each scale had thirty trial items, the tables contained 180 columns and either 92 or 50 rows. The respondents were ranked according to their scores, and their responses to each item were tallied in the appropriate cells.

The array of responses to each item--contained in a six-column field--visually displays the extent of association between positive responses to each item and high scale scores. These arrays were double-dichotomized so as to maximize the association between high total scores and positive responses (provided that the resulting marginal totals were between 20% and 80% of the sample size). Twelve items were selected from the pool of thirty for each scale on the basis of this degree of association as displayed in both samples, with some consideration given to retaining items with differing marginal distributions.

The seventy-two items thus selected have been used in each of the high school studies: the 1958 study of 417 chemistry and physics students, the Bay Area High School Study of 3750 students in 1958, and, with only minor changes to adapt the language usage,[2] the study in 1959 of 894 British secondary school students.

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[1] Louis Guttman, "The Cornell Technique for Scale and Intensity Analysis," Educational and Psychological Measurements, VII, 2 (Summer, 1947), 247-79.

[2] Some substitutions were "maths" for "mathematics", "history course" for "social studies course", "scientific magazine", and "one consisting chiefly of essays" for The Scientific American and The Atlantic Monthly, "crowd" for "gang", "timber" for "lumber", "workshop" for "shop".

Elementary school study

In preparing an inventory for elementary school students, two alternative forms were considered. One used a similar format to the high school study with greatly simplified content, while in the other form the students were asked to choose between an activity associated with one pole and an activity associated with another, with each activity being contrasted with all of the others. The four poles necessitated six paired comparisons in each item. This latter format assured that the same activities which were considered as, say, "theoretic" in contrast to "prudent" would be used in contrasting "theoretic" with "aesthetic" or "immediate" alternatives.

These two forms were administered to samples of 112 and 114 fifth grade elementary school students. Rather than repeating the laborious "Cornell Technique" manual tabulations, each item was cross-tabulated against every other item on the IBM 101. Following the logic of Guttman's cumulative scaling negative responses to an item by persons who had responded positively to less popular items were defined as "errors". The items with the largest total number of errors, in the sense described, were discarded one by one with new totals being obtained after each elimination. (In the paired comparison form, since each "item" involved comparisons on all six scales, a composite total of errors was used to eliminate an item from all six scales simultaneously.)

To illustrate this procedure with a reduced example, consider these cross-tabulations between three items of the Prudent-Theoretic scale (Form B).

## TABLE C-1

### Cross-Tabulations of Items of P-T Scale

| | | 14 | | 10 | | 6 | | |
|---|---|---|---|---|---|---|---|---|
| | | + | - | + | - | + | - | Errors |
| 14 | + | 29 | 0 | 20 | 9 | 27 | 2 | 11 |
| | - | 0 | 85 | 35 | 50 | 56 | 29 | |
| 10 | + | | | 55 | 0 | 51 | 4 | 13 |
| | - | | | 0 | 59 | 32 | 27 | |
| 6 | + | | | | | 83 | 0 | 6 |
| | - | | | | | 0 | 31 | |

Those who responded positively to item 14 "should", according to the cumulative model, have responded positively to item 10 and 6 also, but nine students did not to item 10, and two failed to with item 6, so item 14 is assigned eleven "errors".

When each of the forms had been pared down to the desired nine items, the scales were further collapsed, using Stouffer's "H-Technique",[1] into three compound items requiring two-out-of-three positive responses to the individual items of each group to be assigned a positive score to the whole compound item. When the numbers of errors and the coefficients of reproducibility of each scale were compared on the two forms they were found to be exceedingly close, offering little basis for choice. These tabulations are shown in Table C-2.

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[1] Samuel A. Stouffer, Edgar F. Borgatta, David G. Hays, and Andrew F. Henry, "A Technique for Improving Cumulative Scales," Sociological Studies in Scale Analysis, ed. by Matilda White Riley, John W. Riley, Jr., and Jackson Toby (New Brunswick: Rutgers University Press, 1954), pp. 372-398.

## TABLE C-2

### Frequency Distributions of Response Patterns to Each Scale of Each Trial Form of the Elementary School Inventory

| Scale | P-T | | P-I | | P-A | | T-I | | T-A | | A-I | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Form | A | B | A | B | A | B | A | B | A | B | A | B |
| Pattern | | | | | | | | | | | | |
| + + + | 21 | 20 | 15 | 19 | 21 | 11 | 18 | 25 | 21 | 15 | 15 | 12 |
| - + + | 40 | 33 | 43 | 39 | 41 | 50 | 45 | 36 | 44 | 54 | 41 | 53 |
| *+ - + | 4 | 3 | 8 | 9 | 7 | 4 | 6 | 3 | 10 | 2 | 8 | 9 |
| *+ + - | 4 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 4 | 0 |
| - - + | 28 | 33 | 37 | 28 | 32 | 38 | 30 | 26 | 29 | 31 | 35 | 30 |
| *- + - | 3 | 3 | 2 | 10 | 4 | 2 | 5 | 4 | 4 | 6 | 4 | 6 |
| *+ - - | 0 | 1 | 1 | 0 | 0 | 2 | 2 | 1 | 0 | 1 | 1 | 1 |
| - - - | 12 | 20 | 6 | 7 | 6 | 6 | 5 | 18 | 3 | 5 | 4 | 3 |
| Total | 112 | 114 | 112 | 114 | 112 | 114 | 112 | 114 | 112 | 114 | 112 | 114 |
| Errors | 11 | 8 | 11 | 21 | 12 | 9 | 14 | 9 | 15 | 9 | 17 | 16 |
| C of R | .93 | .95 | .93 | .88 | .93 | .95 | .92 | .95 | .91 | .95 | .90 | .91 |

*Non-cumulative response patterns, classed as errors.

Since the paired comparison form, Form B, provided *a priori* legitimization of the use of the same term to designate a given pole when contrasting it with any other, and would make it possible to rank a student's preferences, it was decided to use that form for the larger sample.

## Scale Evaluation

A considerable amount of evidence has been accumulated in the several studies using these scales which bears upon the validity and reliability of the instrument. This evidence can be grouped into three types: internal analysis of response patterns, the congruence of item and scale score distributions of different samples, and relationships between scale scores and external variables.

### Internal analysis

The cumulative pattern of responses which was used as a basis for the initial selection of items is, when confirmed on subsequent samples, an indication of a degree of uni-dimensionality--an underlying thread of common content which ties the items together--in the set of items, and, as Guttman has argued,[1] a lower-bound to the reliability of the item. (Were students' responses completely unreliable, the inter-item correlations would be randomly distributed about a zero mean.) The coefficients of reproducibility which have been computed for each of the studies being reported here have hovered around .90. These coefficients are summarized in Table C-3.

While, using only three compound items, this is not a very stringent test of unidimensionality, however, when the distribution of responses which would be expected by chance on the basis of the item marginals is computed and compared with the observed distributions, the probability of

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[1] Louis Guttman, "Problems of Reliability," Studies in Social Psychology in World War II, Vol. IV, Measurement and Prediction, ed. by Samuel A. Stouffer (Princeton: Princeton University Press, 1950), pp. 305-311.

## TABLE C-3

### Coefficients of Reproducibility of the Attitude Scales Obtained in Different Studies

| | | High School Form | | | Elementary School Form | |
|---|---|---|---|---|---|---|
| Scale | Sample | OHS | BAHS | BSS | 3rd Grade | 6th Grade |
| | Year | 1957 | 1958 | 1959 | 1959 | 1959 |
| P-T | | .95 | .94 | .93 | .94 | .91 |
| P-I | | .92 | .87 | .91 | .90 | .90 |
| P-A | | .92 | .89 | .91 | .86 | .89 |
| T-I | | .93 | .91 | .91 | .87 | .92 |
| T-A | | .90 | .91 | .94 | .92 | .92 |
| A-I | | .92 | .89 | .90 | .87 | .87 |
| Number of Cases | | 325 | 3750 | 894 | 319 | 816 |

obtaining these observed patterns by chance is found to be infinitesimal. These probabilities were computed and reported in connection with the small high school study in 1957 in an earlier article.[1] Of course, with the larger samples, the probabilities are even more remote. The calculations relating to the P-T scale, for example, are presented in Table C-4.

A second approach to the internal analysis of the response patterns has been through the factor analysis of the item intercorrelations. Using the IBM 704 to perform the required routines, the responses of the 3750

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[1] Edwards and Wilson, "The Development of Scales of Attitudinal Dimensions," op. cit.

### TABLE C-4

### Discrepancies Between the Observed Frequencies of Each Response Pattern of the Prudent-Theoretic Scale and Those Expected Under the Assumption of Independence

| Response Pattern | Observed Frequency | Expected Frequency | Contribution to Chi-Squared |
|---|---|---|---|
| + + + | 601 | 398.2 | 103.3 |
| - + + | 1420 | 1367.0 | 2.1 |
| * + - + | 184 | 295.7 | 42.2 |
| * + + - | 21 | 87.3 | 50.4 |
| - - + | 871 | 1015.1 | 20.5 |
| * - + - | 110 | 299.5 | 119.9 |
| * + - - | 40 | 64.8 | 9.5 |
| - - - | 503 | 222.4 | 354.0 |
| Total | 3750 | 3750.0 | 701.9 |
| C of R | .94 | .87 | |
| P / df=4/ < .001 | | | |

* Non-cumulative response patterns, classed as errors.

American high school students to the 72 interest items were first rescored so that, for example, a score of 1 on a P-T scale item would always indicate strong agreement with the "prudent" alternative rather than agreement with the item as it was written. This entailed reflecting the scores of over half of the items. Each item was then dichotomized into "agree" and "disagree" with the given pole--ignoring the qualifying strength response--and the responses to each item were cross-tabulated against every other item, yielding 72(71)/2=2556 2 x 2 tables. Phi (point) correlation coefficients were computed for each inter-item association. This 72 x 72 matrix of inter-item correlations formed the basic data for the subsequent factor analysis.

Using an IBM SHARE library subroutine[1] the eigenvalues ("characteristic roots") and associated eigenvectors of the matrix of correlations were determined. This matrix of eigenvectors was then standardized into "principal components" by multiplying each vector by the square root of the associated eigenvalue. Several orthogonal rotations toward "simple structure" were attempted,[2] but, since the initial solution was an analysis of the full variance--with unities in the principal diagonal, and a rank equal to the order--the rotations tended to emphasize specific rather than common factors.

As could be anticipated from an examination of the initial correlation matrix which contained a predominance of low correlations (below .10), and many negative correlations, all of the principal components--including the first--were bi-polar, and very little of the variance was extracted with each successive factor.

Nevertheless, the first few factors are amenable to a clear interpretation. The first factor segregates a cluster of intercorrelated items

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[1] F2ANF202, written by Burton S. Garbow, Argonne National Laboratory, Lemort, Illinois.

[2] Jack O. Neuhaus and Charles Wrigley, "The Quartimax Method: An Analytic Approach to Orthogonal Simple Structure," The British Journal of Statistical Psychology, VII, Part II (November, 1954), pp. 81-91.

(with negative loadings) reflecting a preference for the humanities and social studies over natural science, from the remainder of the items. Those items with the highest positive loadings on the first factor clearly indicate a favorable attitude toward natural science. The four items with the highest positive and negative loadings on factor I are listed in Table C-5.

### TABLE C-5

### Factor I

### Favorable Toward Science

Loading

+.54 63. (Disagree that) I would rather be known as the writer of a social column published in many papers than as the Director of an astronomical observatory.

+.48 58. (Disagree that) I would sooner have a big living room for parties than have a workroom for hobbies.

+.45 33. (Disagree that) Scientists destroy much of the beauty of nature when they explain away its mysteries.

+.44 19. (Disagree that) I should rather be elected to the Student Council than be selected as an honor student in science.

### Prefer Humanities to Science

-.45 49. (Agree that) I like history and civics much better than science and mathematics.

-.45 64. (Disagree that) If I had an hour to wait for a train I should more likely read *The Scientific American* than *The Atlantic Monthly*.

-.39 45. (Agree that) I should rather read and be able to understand William Shakespeare's *Hamlet* than Michael Faraday's *Experimental Researches in Electricity*.

-.38 6. (Agree that) I am more interested in finding out how TV has affected people's taste than in finding out how TV works.

The second factor subdivides items which have positive loadings on the first factor into two groups. (Items with negative loadings on the first factor also have negative loadings on the second, so they are not further divided.) Positive loadings on factor II reflect a technical manipulative preference while negative loadings reflect a deliberative and moralistic orientation. The leading items in this cross-classification are listed in Table C-6.

### TABLE C-6
### Factor II

Technical-Manipulative

Loading

+.46 37. (Agree that) I should prefer to be a machinist rather than a salesman.

+.25 43. (Agree that) When I was little I liked erector sets more than tops.

+.25 67. (Agree that) I prefer a science class that is run along fairly formal lines so that I can avoid the distractions arising from personal entanglements with other members of the class.

+.22 30. (Agree that) It's a sloppy sailor who'll let his sails flap while he basks in the sun and breathes the crisp salty wetness of the air; the keen sailor watches the wind, studies the tides, and understands details of the rigging.

Moralistic-Deliberative

-.38 57. (Disagree that) Because they need to get close to life, artists are entitled to special consideration if they treat lightly the ties of marriage.

-.37 65. (Disagree that) An impulsive person is warm and sincere; one who analyzes his emotions is cold and "phony".

Table C-6--Continued

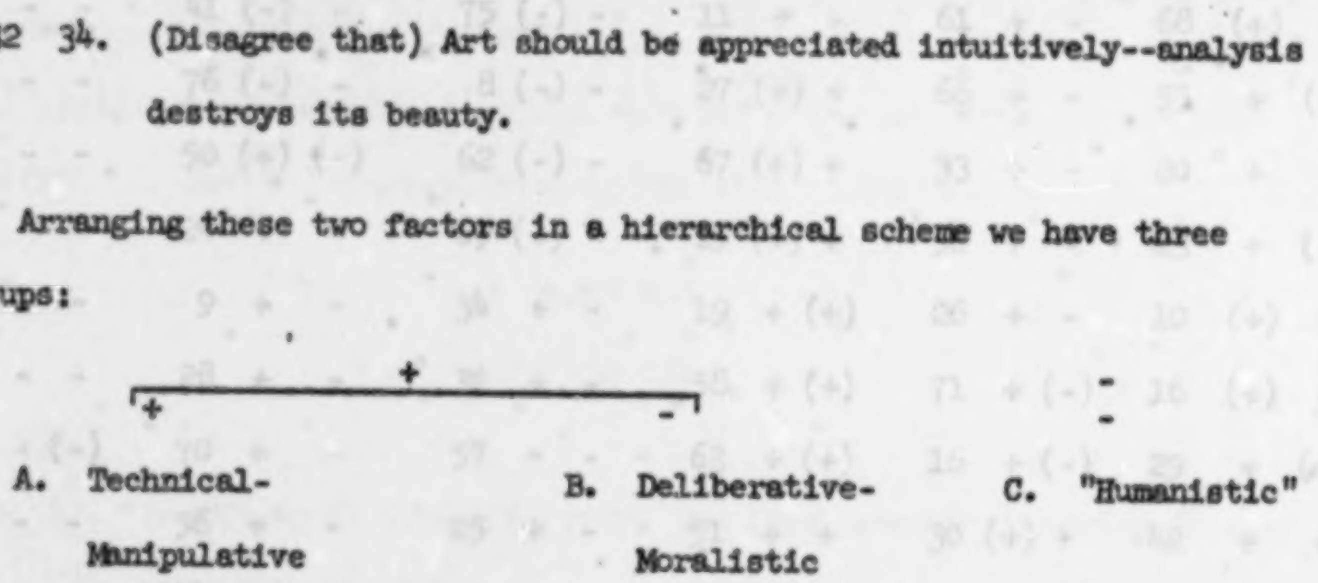
Moralistic-Deliberative--Continued

-.36 24. (Disagree that) When talking with my friends in the evening I'd rather talk about people we know and have fun with than talk about religion or philosophy.

-.34 70. (Disagree that) Sometimes when a fellow is out with the gang, he pretty well has to do a few things he knows he really shouldn't.

-.32 34. (Disagree that) Art should be appreciated intuitively--analysis destroys its beauty.

Arranging these two factors in a hierarchical scheme we have three groups:



In trying to fit the intended concepts of the scales into this scheme, we would clearly expect to find all twelve of the Prudent-Theoretic items in group C, and the Prudent-Immediate and Prudent-Aesthetic items in group B. We would also expect group A to include the Theoretic-Immediate items. However the Theoretic-Aesthetic and Aesthetic-Immediate scales do not fit clearly into the factorial scheme, while clearly these latter scales should not relate to the P-T items, and therefore should have positive signs on the first factor, no expectation is clearly warranted on the second.

Looking at the sign pattern attaching to each item in Table C-7, we find most of the expectations confirmed. All but one of the P-T items have the expected "- -" pattern, and the great majority of the P-I and P-A items have the "+ -" pattern indicating their association with the deliberative

### TABLE C-7

### Sign Patterns* of the Items of the Six Scales on the First Two Principal Components

| P-T | P-I | P-A | T-I | T-A | A-I |
|---|---|---|---|---|---|
| 64 - - | 31 - (+) | 39 - - | 36 + - | 38 + - | 48 (+) (-) |
| 49 - - | 41 (-) - | 75 (-) - | 11 + - | 61 + - | 68 (+) - |
| 45 - - | 76 (-) - | 8 (-) - | 27 (+) + | 66 + - | 55 + (-) |
| 6 - - | 50 (+) (-) | 62 (-) - | 67 (+) + | 33 + - | 20 + - |
| 12 - - | 24 + - | 69 (+) - | 15 (+) + | 52 + - | 23 + (-) |
| 59 - - | 9 + - | 34 + - | 19 + (+) | 26 + - | 10 (+) + |
| 35 - - | 28 + - | 32 + - | 58 + (+) | 71 + (-) | 16 (+) + |
| 17 - (-) | 70 + - | 57 + - | 63 + (+) | 18 + (-) | 29 + (+) |
| 54 - - | 56 + - | 25 + - | 51 + + | 30 (+) + | 42 + + |
| 40 - - | 14 + - | 13 + - | 7 + + | 77 + (+) | 37 + + |
| 73 (-) - | 65 + - | 47 + (-) | 74 + + | 22 + + | 60 (+) - |
| 21 + - | 44 (+) (-) | 53 (-)(+) | 46 + + | 43 + + | 72 (-) (+) |

*The signs of insignificant loadings, under /.10/, are enclosed in parentheses.

and moralistic items. Ten of the Twelve T-I items have the anticipated "+ +" (technical) pattern; and the T-A and A-I items are "+" on factor one (proscience), and varied on factor II.

Some of the reversals serve to correct, a posteriori, the stereotypes of the authors. Item 39, for example, which was intended to contrast prudent with aesthetic interests called for a choice between becoming a minister and a forest ranger. While the minister was correctly seen as "humanistic", the students evidently perceived the forest ranger more as a scientific naturalist than as a woodsman, thus responding to this item in the same way as they did to the prudent-theoretic items.

By and large, however, the results of this analysis tend to substantiate the validity of the scale content.

While the basis for the clustering of items on subsequent factors was interpretable, the interpretation is not particularly relevant to our concerns here. The third factor brought out a cluster of "arty" or "high-brow" preferences, and the fourth a preference for solitary over social activities. These are exemplified by the list in Table C-8.

### TABLE C-8

### Factor III

Loading

-.44 41. (Agree that) I should prefer the live theater to movies if they were the same price.

-.41 8. (Agree that) I find painting interesting when I am able to see how they represent the artists' attitudes toward life.

-.37 72. (Agree that) If I had the necessary athletic prowess I should prefer to excell in the cross-country-marathon than in football.

### Factor IV

-.47 29. (Agree that) I would rather go sailing by myself than watch a football game.

-.38 16. (Agree that) I like to ride alone. The feel of a good horse under me, his strength and his rhythm, more than make up for the lack of fellow riders.

-.37 23. (Disagree that) Sailing on a boat would be fun with a group of people, but I don't think I'd care much for it by myself.

The concordance of samples

A second type of evidence which bears, albeit indirectly, upon the reliability of the interest items and scales, is the similarity of the distribution of responses of distinct samples of students. As was mentioned above, when discussing the cumulative pattern of responses to the items of a given scale, were responses to an item totally unreliable they would be distributed at random. In the case of a dichotomous item this would mean that 50% of the population would check one response and 50% the other, with sample proportions varying randomly about this population parameter. Thus when several independent samples heavily agree or disagree, as the case may be, with an item, this speaks both for the similarity of attitude distributions in the populations and sets a minimal bound to the reliability of the item.[1]

In an earlier report[2] to the U. S. Office of Education, the concordance of the rank order of item popularities among the thirteen high schools in the Bay Area Study of 1958 was described in detail. The coefficients of concordance[3] ranged from .73 in the case of the A-I scale items to .90 in the case of P-I scale items.

When the same (or closely translated) items were administered to English school children, the similarity of the distributions of their responses to those given by American students was remarkable. For example, to the item, "I would rather teach science than do research," the distributions were:

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[1] Louis Guttman, "The Test-Retest Reliability of Qualitative Data," Psychometrika, Vol. 11, No. 2 (June, 1946), pp. 81-95.

[2] Edwards and Wilson, Final Report, op. cit.

[3] M. A. Kendall, Rank Order Correlation Methods.

| | Agree | | | | | Disagree |
|---|---|---|---|---|---|---|
| Sample | 5 | 4 | 3 | 2 | 1 | 0 |
| England | 6% | 7% | 9% | 12% | 21% | 45% |
| U. S. | 8 | 8 | 9 | 12 | 21 | 42 |

Using the same cutting-points to dichotomize items, and combining the same groups of items into "compound items" by the H-Technique, we find that a comparable cumulative structure is maintained between the items within scales in the British sample, and that these collapsed scales have quite similar distributions. In Table C-9 the distributions of scale scores of the American and British samples are presented for comparison.

TABLE C-9

Comparison of Scale Score Distributions of American and English High School Samples

| | P-T | | P-I | | P-A | | T-I | | T-A | | A-I | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Score | Eng. | U.S. | Eng. | U.S. | Eng. | U.S. | Eng. | U.S. | Eng. | U.S. | Eng. | U.S. |
| 3 | 18% | 16% | 7% | 13% | 5% | 13% | 18% | 13% | 12% | 15% | 27% | 16% |
| 2 | 40 | 43 | 21 | 37 | 28 | 37 | 42 | 41 | 28 | 37 | 30 | 33 |
| 1 | 23 | 27 | 44 | 38 | 46 | 37 | 30 | 35 | 41 | 36 | 31 | 36 |
| 0 | 19 | 13 | 28 | 12 | 21 | 12 | 10 | 11 | 19 | 12 | 12 | 15 |
| Total | 100% | 99% | 100% | 100% | 100% | 99% | 100% | 100% | 100% | 100% | 100% | 100% |
| C of R | .93 | .94 | .87 | .87 | .91 | .89 | .91 | .91 | .94 | .91 | .87 | .89 |

The largest discrepancy in distributions lies in the Prudent-Immediate scale in which the British students show less inclination to assume a moralistic stance than do the American students. This, of course, is reflected in the individual items upon which the scale scores are based. For example, in response to the item, "Mercy killing should be legalized for cases of extreme suffering where there is no hope for cure", the British students display, in general, a more hard-boiled attitude. The distributions are:

| Sample | Agree<br>5 | 4 | 3 | 2 | 1 | Disagree<br>0 |
|---|---|---|---|---|---|---|
| England | 43% | 21% | 17% | 7% | 4% | 7% |
| U. S. | 16 | 14 | 17 | 12 | 12 | 28 |

This exception to the comparability which is generally found between the item distributions does not affect the argument concerning reliability since that argument only works one way. Either unreliability or genuine population differences can lead to discrepancies between sample distributions. This difference is consistent with the greater piousness which de Tocqueville remarked of the American public ethos.[1]

Predictive validity

What has been, to the authors, the most compelling grounds for accepting the scales as indicating, to some extent, what they purport to indicate, is the fact that the scales--at least those which have been used most extensively in analysis--associate in reasonable and anticipatable ways with external variables.

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[1] Alexis de Tocqueville, Democracy in America (New York: Vintage Books, 1959), I, 315 ff., II, 215 ff.

We should expect that students who aspire to become scientists or technicians would exhibit more theoretic orientations than those who hope to go into behavioral science, humanities, or welfare-type pursuits (on the Prudent-Theoretic scale). And while other factors than interest impinge upon achievement, we would certainly anticipate that students interested in science would do relatively better work in science than, say, in Social Studies or English, while the converse would be true of those with "prudent" interests.

From our very earliest speculative writing[1] about the relationship between attitudes and achievement we had hypothesized that a deliberative orientation would be conducive to higher achievement than a proximate, immediate stance. Hence we had a clear expectation that the P-I scale would discriminate between the high and low achievers.

While all of the tabulations and interpretations in the text of this report bear upon this point, the following three tables have been selected to present here as being particularly pertinent to this discussion.

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[1] T. Bentley Edwards and Alan B. Wilson, "Attitudes Toward the Study of School Subjects," Educational Theory, VIII (October, 1958), pp. 275-84.

## TABLE C-10

### Percentages of Students in Three Samples Aspiring to Scientific or Technical Occupations, as Contrasted with Humanistic or Welfare Positions, by Sex and Prudent-Theoretic Scale Scores.

| | Boys | | | | Girls | | | |
|---|---|---|---|---|---|---|---|---|
| Sample | Pr-3 | 2 | 1 | 0-Th | Pr-3 | 2 | 1 | 0-Th |
| Bay Area H.S. | 23%<br>(66) | 56%<br>(208) | 75%<br>(268) | 92%<br>(232) | 5%<br>(132) | 8%<br>(290) | 25%<br>(103) | 33%<br>(39) |
| British Secondary | 20<br>(46) | 64<br>(84) | 82<br>(72) | 89<br>(85) | 14<br>(14) | 20<br>(15) | 36<br>(14) | --<br>(1) |
| Berkeley Elementary 6th Grade | 20<br>(10) | 30<br>(30) | 63<br>(62) | 81<br>(79) | 0<br>(48) | 6<br>(94) | 25<br>(48) | 71<br>(17) |

## TABLE C-11

### Percentage Distribution of Subject Areas in Which Higher Grades are Received by Bay Area High School Students, Classified by Sex and Prudent-Theoretic Scale Scores

| Subject Area in which Higher Grades are Received | Boys | | | | Girls | | | |
|---|---|---|---|---|---|---|---|---|
| | Pr-3 | 2 | 1 | 0-Th | Pr-3 | 2 | 1 | 0-Th |
| Social Studies and English | 50% | 40% | 35% | 25% | 58% | 61% | 55% | 43% |
| Mathematics | 6 | 13 | 16 | 23 | 5 | 7 | 6 | 9 |
| Number of Cases | 127 | 438 | 449 | 346 | 267 | 569 | 206 | 56 |

## TABLE C-12

### Percentages of Students Receiving High Marks (A or B) in Various Subject Areas According to Prudent-Immediate Scale Scores.

| Sample | Subject | Prudent 3 | 2 | 1 | Immediate 0 |
|---|---|---|---|---|---|
| Bay Area High Schools | | | | | |
| | Social Studies & English | 62%<br>(496) | 41%<br>(1368) | 29%<br>(1401) | 19%<br>(440) |
| | Mathematics | 44<br>(409) | 33<br>(957) | 30<br>(871) | 8<br>(667) |
| | Science | 57<br>(437) | 38<br>(1217) | 29<br>(1208) | 24<br>(383) |
| | Median Academic Grade | 58<br>(496) | 37<br>(1369) | 26<br>(1403) | 18<br>(442) |
| Berkeley Sixth Grade | | | | | |
| | Social Studies | 58<br>(116) | 48<br>(277) | 42<br>(306) | 34<br>(117) |
| | Reading | 61<br>(116) | 48<br>(277) | 46<br>(306) | 40<br>(117) |
| | Arithmetic | 57<br>(116) | 48<br>(277) | 42<br>(306) | 39<br>(117) |
| | Science | 56<br>(116) | 48<br>(277) | 38<br>(306) | 34<br>(117) |

## APPENDIX D

## ESTIMATION OF SCHOOL DISTRICT POPULATION ATTRIBUTES FROM UNITED STATES CENSUS DATA

In order to estimate the distribution of the population characterized by a given attribute in a school district, from the reported distribution by census districts, it is necessary to determine the proportion of the population of each census district which falls within each school district. Taking these proportions as weights, the number of persons with a given characteristic in the school district is estimated by the weighted sum of the number of persons with that characteristic in the contributory census districts.

To determine these proportions, census district boundaries were first superimposed upon a school district map (as shown in Figure 1). The blocks in the interstitial areas of choice between school districts were assigned to school districts on the basis of the apparent proximity and accessibility of the nearest school. All of the blocks of each census tract were numbered on the map, using the numbers assigned in the U.S. Census of Housing: 1950, Block Statistics.[1] The block numbers of each census district falling within each school district were listed (e.g., Thousand Oaks School District includes block numbers 10, 20-31, and 44-50 of census tract 6-D, and 1-56 and 59-60 of tract 6-E.) Referring then to the census of occupied dwelling units by blocks, the number of units from each tract in each school district was totalled (e.g., Thousand Oaks, again, contains 490 occupied units in tract 6-D, and 1375 occupied units in 6-E).

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[1] U.S. Census of Housing: 1950, Vol. V, Block Statistics, op. cit.

Since 6-D contains 1258 occupied dwelling units altogether, 490/1258 = .390 is the proportion of 6-D's occupied dwelling units in the Thousand Oaks School District.

The proportion of dwelling units is, of course, only an approximation of the population proportion (assuming that there are no systematic differences in the number of persons per household between the various parts of the tract); and using this proportion to divide population sub-groups assumes that the persons with the characteristic under consideration, in turn, are fairly evenly distributed through the census tract. In spite of these assumptions, which cannot be verified, the amount of bias is probably negligible since large portions, or even whole, census tracts often fall in a single school district. The possibility of bias is even less, accordingly, for the larger strata estimates.

The proportions which have been used as factors for these estimates are tabulated in Table D-1.

TABLE D-1 --Proportion of occupied dwelling units from each census tract in each elementary school district: Berkeley, 1950

A. Hills school districts

| Census tract | School district | | | | | | Hills total |
|---|---|---|---|---|---|---|---|
| | Crag. | Hill. | J.M. | T.O. | Ox. | Em. | |
| 1-A | | | | | | | .000 |
| 1-B | | | | | | | .000 |
| 2-A | | | | | | | .000 |
| 2-B | | | | | | | .000 |
| 2-C | | | | | | | .000 |
| 2-D | | | | | | | .000 |
| 3-A | | | | | | | .000 |
| 3-B | | | | | | | .000 |
| 3-C | | | .195 | | | .584 | .779 |
| 3-D | | | .446 | | | .554 | 1.000 |
| 3-E | | | 1.000 | | | | 1.000 |
| 4-A | | | | | | | .000 |
| 4-B | | | | | | | .000 |
| 4-C | | | | | .018 | | .018 |
| 4-D | | | | | | | .000 |
| 4-E | | | | | | | .000 |
| 5-A | | | | | | | .000 |
| 5-B | | .399 | | | | .285 | .684 |
| 5-C | .040 | .852 | | | .108 | | 1.000 |
| 5-D | | .084 | | | .434 | | .518 |
| 5-E | | .225 | | | | | .225 |
| 6-A | .050 | | | | .950 | | 1.000 |
| 6-B | .810 | | | | .190 | | 1.000 |
| 6-C | 1.000 | | | | | | 1.000 |
| 6-D | .610 | | | .390 | | | 1.000 |
| 6-E | | | | .876 | | | .876 |

### TABLE D-1--Continued

B. Foothills school districts

| Census | School district | | | | Foothills |
|---|---|---|---|---|---|
| tract | W.-U. | L.C. | Jeff. | Wash. | total |
| 1-A | | | | | .000 |
| 1-B | | | | | .000 |
| 2-A | | | | | .000 |
| 2-B | | | | | .000 |
| 2-C | | | | .091 | .091 |
| 2-D | | | | | .000 |
| 3-A | | .522 | | .151 | .673 |
| 3-B | | 1.000 | | | 1.000 |
| 3-C | | .221 | | | .221 |
| 3-D | | | | | .000 |
| 3-E | | | | | .000 |
| 4-A | | | | .249 | .249 |
| 4-B | | | | .951 | .951 |
| 4-C | .318 | | .663 | | .981 |
| 4-D | | | .407 | | .407 |
| 4-E | | | .347 | | .347 |
| 5-A | | .126 | | .874 | 1.000 |
| 5-B | | .260 | | .057 | .317 |
| 5-C | | | | | .000 |
| 5-D | .482 | | | | .482 |
| 5-E | .775 | | | | .775 |
| 6-A | | | | | .000 |
| 6-B | | | | | .000 |
| 6-C | | | | | .000 |
| 6-D | | | | | .000 |
| 6-E | | | .124 | | .124 |

### TABLE D-1--Continued

C. Flats school districts

| Census tract | School district<br>Frank. | Long. | Linc. | Col. | Flats total |
|---|---|---|---|---|---|
| 1-A | 1.000 | | | | 1.000 |
| 1-B | | .166 | .047 | .787 | 1.000 |
| 2-A | | .236 | .764 | | 1.000 |
| 2-B | | .050 | .950 | | 1.000 |
| 2-C | | .909 | | | .909 |
| 2-D | | 1.000 | | | 1.000 |
| 3-A | | .074 | .253 | | .327 |
| 3-B | | | | | .000 |
| 3-C | | | | | .000 |
| 3-D | | | | | .000 |
| 3-E | | | | | .000 |
| 4-A | | .134 | | .617 | .751 |
| 4-B | | .049 | | | .049 |
| 4-C | | | | | .000 |
| 4-D | .593 | | | | .593 |
| 4-E | .653 | | | | .653 |
| 5-A | | | | | .000 |
| 5-B | | | | | .000 |
| 5-C | | | | | .000 |
| 5-D | | | | | .000 |
| 5-E | | | | | .000 |
| 6-A | | | | | .000 |
| 6-B | | | | | .000 |
| 6-C | | | | | .000 |
| 6-D | | | | | .000 |
| 6-E | | | | | .000 |